Chapter Four

Traditional medicine and child care in Western Africa: mothers' knowledge, folk illnesses, and patterns of healthcare-seeking behavior

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Abstract

Background

In spite of the strong role of traditional medicine in childcare in the pluralistic healthcare system in Western Africa, little information is known on mothers' domestic plant knowledge. Identifying local perspectives and treatments of children's illnesses, including folk illnesses, is essential to having a comprehensive understanding of how mothers make healthcare treatment decisions. We aimed to identify which infant illnesses Beninese and Gabonese mothers knew to treat with medicinal plants and for which illnesses they sought biomedical care or traditional healers.

Methods

We conducted 81 questionnaires with mothers in Bénin and Gabon and made 800 botanical specimens of cited medicinal plants. We calculated the number of species cited per illness and the proportion of participants knowledgeable on at least one herbal remedy per illness. Using qualitative data, we described folk illnesses in each country and summarized responses on preferences for each of the three healthcare options.

Results

Participants from both countries were most knowledgeable on plants to treat respiratory illnesses, malaria, diarrhea, and intestinal ailments. Mothers also frequently mentioned the use of plants to encourage children to *walk early*, monitor the closure of *fontanels,* and apply herbal enemas. Major folk illnesses were *atita* and *ka* in Bénin and *la rate* and *fesse rouge* in Gabon. Traditional healers were reported to have specialized knowledge of cultural bound illnesses. Malaria was frequently cited as an illness for which mothers would directly seek biomedical treatment.

Conclusion

Mothers largely saw the three systems as complementary, seamlessly switching between different healing options until a remedy was found. Folk illnesses were found to give insight into local treatments and may reveal important neglected diseases. Due to high reported levels of knowledge on treating top statistical causes of infant mortality and folk illnesses, mothers' medicinal plant knowledge should be included in the analysis of healthcare-seeking behavior for childcare.

Introduction

Sub-Saharan African healthcare is essentially pluralistic, structured around three main systems: biomedical care, traditional healers, and popular knowledge (van der Geest 1997; Nyamongo 2002). In spite of the promotion of biomedicine by international healthcare organizations, traditional medicine remains the primary form of healthcare for more than 80% of African populations (WHO 2008). Traditional medical systems include not only traditional healers, but also the popular knowledge of local populations, known as domestic medicine or home remedies. Most ethnobotanical literature on traditional medicine is concentrated on the knowledge of traditional healers and largely overlooks domestic medicine, the knowledge of women, (Pfeiffer and Butz 2005) and more specifically, the knowledge of mothers (Vandebroek 2013; McDade et al. 2007). Since home remedies (self-treatment with herbs) comprise the majority of African medicine (van der Geest 1997; Pearce 1993; Geissler et al. 2002), domestic knowledge needs to be prioritized in medical research and reinforced in order to improve healthcare and enhance local populations' responses to illness. This point is especially critical in high priority health populations, such as infants and children in sub-Saharan Africa (Black et al. 2010).

African mothers' knowledge of health is directly associated with children's well-being, as women are largely responsible for childcare (Miller 2011; Geissler et al. 2002). Recent ethnobotanical research has found that mothers' knowledge of herbal medicine has a positive effect on child health outcomes, including a decrease in infections (Miller 2011; Tanner et al. 2011). Mothers who had high levels of plant knowledge and use have been shown to have healthier children (McDade et al. 2007) and a greater likelihood to take ill children to a dispensary, suggesting that knowledge in one healthcare domain corresponds with better overall understanding of health (Miller 2011).

In spite of these correlations, biomedical studies have largely measured mother's health-seeking behavior on factors related to biomedical care, such as formal education, distance to provider, and cost of obtaining care (Rutherford 2010). This literature overlooks if and what role local concepts of illness have in treatment choices and results in the loss of incorporating this information into infant health programs (Beiersmann and Sanou 2007). Local concepts of illness include not only local names, perceptions, and symptoms of biomedical illnesses, but also *cultural bound syndromes*, "a group of folk illnesses, each of which is unique to a particular group of people, cultural, or geographical area (Helman 2007). Some scholars have cautioned that the "cultural" component of the term *cultural bound syndromes* emphasizes the biomedical perspective that biological illnesses are more objective than folk illnesses (Helman 2007). We use the term in order to designate those illnesses not generally defined and recognized in biomedicine.

Understanding local perspectives of the treatment of major children's illnesses identified by the WHO (Colvin et al. 2013), such as malaria (Nsungwa-Sabiiti et al. 2004; Beiersmann and Sanou 2007) and diarrhea (de Zoysa et al. 1984; Green 1985), as well as the treatment of children's folk illnesses (Straus et al. 2011; Mogensen 2000), is essential to having a comprehensive understanding of childcare in Africa. In this study, we assessed how mothers make healthcare decisions by identifying which infant illnesses mothers in Western Africa treat with medicinal plants and for which illnesses they seek biomedical care or consult traditional healers. We worked in Bénin and Gabon, two African countries with diverse populations, vegetation types, cultures, and levels of human development. Our research was based on the following research questions: *Which children's illnesses do Beninese and Gabonese mothers treat with medicinal plants? What are the major children's folk illnesses in each country? For which ailments do mothers seek treatment from biomedical doctors? Which illnesses do mothers prefer to be treated by traditional healers?*

Methods

Study areas

Bénin is located in West Africa, with a surface area of 112,622 sq. km and a population of 9.8 million people (CIA 2013a). It is ranked below the Sub-Saharan average in the Human Development Index (HDI) and considered a country of "low human development" (UNDP 2013a). It has an infant mortality ratio of 58 deaths per 1,000 live births (CIA 2013a). Gabon is located in Western Central Africa, with a surface area of 267,667 sq. km, and a population of 1.7 million people (CIA 2013b). The UNDP ranked Gabon 106th in the Human Development Index, slightly above countries of "medium human development" (UNDP 2013b). It has an infant mortality ratio of 48 deaths per 1,000 live births (CIA 2013b).

Data collection and analysis

Between April and October 2011 we worked in rural and urban areas of Bénin, mainly with Fon and Yoruba ethnic groups in the southern departments Collines, Kouffo, Zou, Plateau, Ouémè, Atlantique, Mono, and Littoral (Fig. 1).

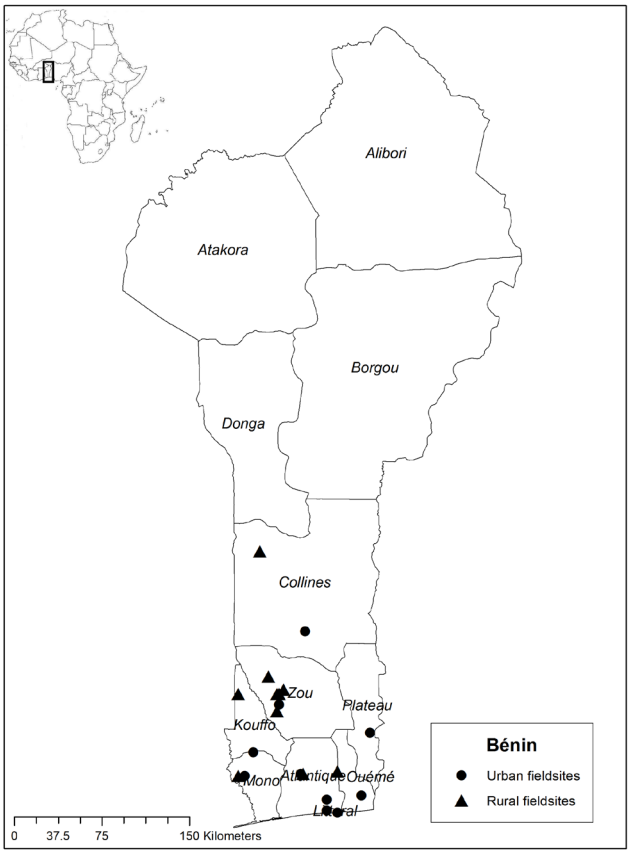

Fig. 1 Map of the Bénin fieldwork sites in 2011

From June until December 2012, we worked with Bantu-speaking ethnic groups in Gabon, namely, the Fang, Mitsogo, Obamba, and Bapounou peoples, in the departments of Estuaire, Woleu-Ntem, Haut-Ogooué, Ngounié, and Ogooué-Ivindo (Fig. 2).

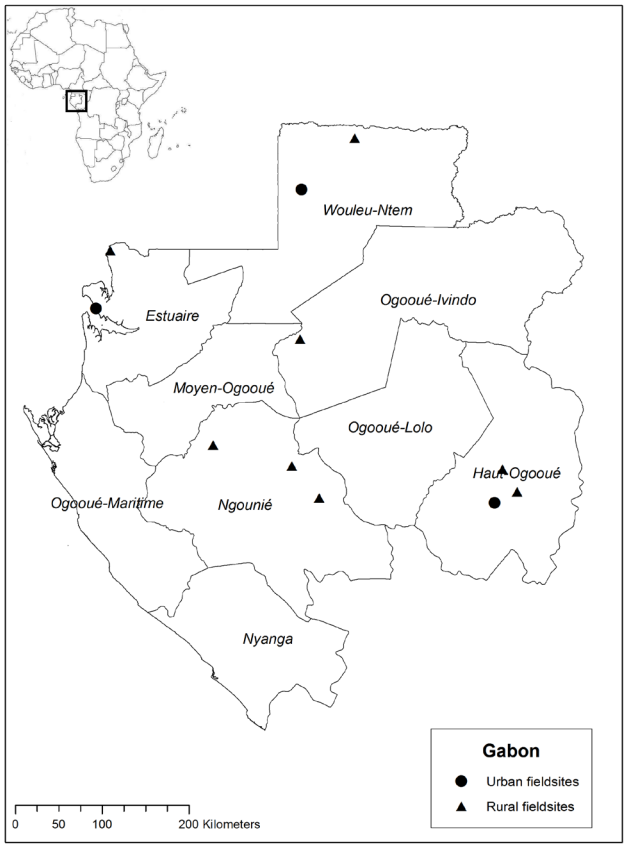

Fig. 2 Map of the Gabon fieldwork sites in 2012

We started our research at the herbal marketplaces in each country, taking time to familiarize ourselves with commonly utilized species, local illnesses and healthcare practices. From these initial market contacts, we utilized snowball sampling to identify women from surrounding urban and rural communities. We conducted an ethnobotanical questionnaire on practices related to childcare, including questions on herbal remedies for specific illnesses, definitions of folk illnesses, and preferences for the three types of healthcare. In total we interviewed 43 Beninese and 38 Gabonese mothers. In Bénin we worked with the following ethnic groups: Fon and related (70%), Yoruba and related (14%), Adja and related (5%) and mixed ethnicities (11%). In Gabon we worked with the following ethnic groups: Fang (45%), Mitsogo (16%), Babungu (16%), Obamba (8%), Bapounu (5%), and other (Ossimba, Omiene, Bateke) (10%). All women received financial compensation equivalent to local salaries for their time and involvement. We conducted the questionnaires orally in French, at participants' homes and workplaces, and employed local language interpreters when needed.
After each of the 81 questionnaires, we accompanied participants to collect the plants that were cited in the interviews. We used standard botanical collection methods to make vouchers of plants from the

surrounding gardens, forests, and savanna landscapes (Martin 2004). For women that we interviewed on the market, we purchased plants directly from market stalls and made trips into the field together to collect fresh samples when possible. In addition to the voucher specimens, we collected detailed information on their use, effects, and local names (see Table S1 and S2). We deposited vouchers of all collected plants at the Herbier National du Bénin (BEN) and the Herbier National du Gabon (LBV). A complete set of duplicates was exported to the Wageningen branch of National Herbarium of the Netherlands (WAG), now merged with Naturalis Biodiversity Center, where the specimens were identified by the research team and several botanical specialists. Our plant collection did not involve endangered or protected plant species.

We assessed mothers' knowledge of domestic medicine by calculating the number of species for each health issue and the percentage of mothers who knew at least one herbal recipe for each illness. We then summarized descriptions of folk illnesses and selected qualitative data from our interviews to illustrate which illnesses mothers treated with the three systems of healthcare: biomedicine, their own plant knowledge, or traditional healers. Maps of the fieldwork locations were created in ArcGIS 10.1 using open source geospatial data from DIVA-GIS (http://www.diva-gis.org/).

Ethics statement

We adhered to all components of the Code of Ethics of the International Society of Ethnobiology (International Society of Ethnobiology 2006), including carefully explaining the nature of our research, receiving oral consent, providing monetary compensation for involvement in the work, anonymizing informants' identities during data analysis, and working in a fully mindful and respectful manner. Oral consent was acquired in place of written consent due to the largely illiterate populations with whom we worked. We followed all research procedures and protocols at Leiden University, Naturalis Biodiversity Center, and the host institutes in each country. For the Bénin fieldwork, we acquired a formal invitation from the Faculté des Sciences Agronomiques, Université d'Abomey-Calavi (UAC), received a research permit (# 041511) from the Faculté des Sciences et Techniques (UAC), and obtained a plant export permit (#0000591) from the Service de la Protection des Vegetaux et du Control Phytosanitaire, Ministre de l'Agriculture, de l'Elevage et de la Peche. For the Gabon fieldwork, the Centre National de la Recherche Scientifique et Technologique (CENAREST) provided a letter of invitation (#176). After approving our research proposal, CENAREST granted research permit (#AR0028/12). We acquired authorization to enter the National Parks of Gabon (#000026) from the Agence Nationale des Parcs Nationaux (ANPN), and authorization to export botanical specimens (#00145, #00219) from the L'Institut de Pharmacopée et de Médecine Traditionelles (IPHAMETRA). We received formal administrative approval from our host institutes and were not required to submit our proposals to a human subjects review board for further review.

Results

Mothers' knowledge of treating biomedical childhood illnesses with plants

Beninese participants cited 255 medicinal plant species and Gabonese participants cited 179 species. All species, together with vernacular names, scientific names and specific uses, are listed in Appendix 1 (Bénin) and Appendix 2 (Gabon). The highest percentages of plants in both countries were used to treat those child illnesses considered to be of major concern by the WHO: diarrhea, respiratory conditions, and malaria. Over 95% of women in Bénin and over 84% of women from Gabon knew at least one recipe to treat those diseases (Table 1). Respiratory-related ailments included illnesses such as the flu, cough, asthma, bronchitis, and specific folk illnesses related to respiratory problems in the case of Gabonese informants. Mothers also mentioned children's ailments such as earache, chicken pox, colic, stomachache and vomiting, which we left out of the table because few plants and treatments were cited.

Children's Folk illnesses in Bénin

Mothers from Bénin mentioned two main folk illnesses, *atita* (Fon) and *ka* (Fon), and several cultural practices. *Atita* was described as a rash with "red bumps coming from the anus" or "itchy and stinging" red bumps in the groin and armpits. It was reported to be caused by the over-consumption of sugar or peanuts by the child or by the mother during pregnancy. The most common treatment for *atita* was an herbal bath or boiled plants consumed as tea (Appendix 1). *Ka* was described as an infection with large red bumps that were caused by the heat. It was reported to be treated by herbal baths, ingested teas, and through applying macerated plants directly to the infection.

The care and maintenance of open *fontanels* was a common practice in Bénin. Mothers' considered it to be important for the soft spot of the fontanel to be able to "breathe" and eventually close. They used various herbal pomades, washes, and ingested teas for young children whom became ill from the failure of the fontanels to close. Beninese mothers highly valued their children to *walk early* in life. They encouraged their children with massages, herbal baths, and ingested teas. *Walking early* was seen as a sign that the child was developing normally and gaining independence, which would enable the mother to rest. Enemas were administered to newborn infants to remove the meconium, as well as to older infants for daily cleanses and constipation relief. These enemas frequently contained ground red peppers (*Capsicum annuum*) or different species of melegueta pepper (*Aframomum* spp.) mixed with water. Strengtheners were used in herbal treatments for premature birth, as newborn strengtheners, and in general to assist an infant's growth. Delayed and stunted growth was explained by mothers to be caused either by malnutrition or if an expectant mother came in contact with a praying mantis (hence the hunched over appearance and thin arms of an infant). It was treated with an herbal bath with an herbal recipe that included the eggs of a praying mantis. Various herbal treatments were applied to the umbilical cord of newborns to hasten the recovery period, as well as the application of herbs to assist in the healing process of circumcision.

Children's Folk Illnesses in Gabon

Gabonese and Beninese mothers shared the cultural practices of monitoring the closure of the *fontanels*, encouraging children to *walk early*, and bathing newborns and young children to give strength. Monitoring the closure of *fontanels* (*abobane* in Fang) in Gabon was considered necessary to avoid "bad wind or spirits" that could enter, resulting in a child's stunted growth. Herbal treatments included applying pomade made from leaves directly to the infants' head and applying peanut butter to the palate of the mouth (Appendix 2). Mothers pointed out that not all children suffered from open *fontanels*. Encouraging children to *walk early* also was seen as the mothers' recuperation of independence; they could do more work because the child could run outside with its siblings. One of the most commonly mentioned Gabonese folk illnesses was known as *fesse rouge* in French (*ntcheke* in the Babungu language, *kusu* in Punu, *tzogho* in Fang, and *kengey* in Teke). Like its literal French translation, the symptoms of *fesse rouge* included a red, irritated bottom caused "by sitting in the dirt," "by microbes," or "during childbirth when heat enters the body through the anus." Treatments included applying herbal pomades and herbal enemas.

Folk illness *la rate (tzit* in Fang and *kabama* in Teke*)* which in English is translated as "the spleen," was characterized by a tender, swollen left side of the body and a skinny overall physical build. An earlier stage of *la rate*, known as *ebem* in Fang, was characterized by high fever and green feces. Although most respondents were not aware of the cause of *la rate*, some participants mentioned God's will, anemia, and malnutrition as possible causes. Treatments included herbal massages, herbal enemas, and traditional "vaccinations"- the creation of small incisions on the left side of the body with a razor blade and application of the fresh juice of plants into the cuts. Folk illness *pogha* (in *Mitsogo* and *Babungu* languages) was characterized by fever, fatigue, convulsions, but distinct from the symptoms of malaria. It was reported to be caused either by God's will or the mother's food consumption when the child was young. Herbal baths were the primary form of treatment. Included in the calculations for respiratory-related ailments (Table 1) were several recipes mentioned by Fang women for respiratory-related folk illnesses, including *onkoe abijel*: "respiratory problems caused by bad water during delivery," *onkouabial*: "bad lungs after birth," and *ebulonkuk*: "bad lungs caused by sorcery."

Mothers' knowledge of treating folk illnesses with plants

Aside from the use of plants for intestinal cleansing, fewer women knew how to treat folk illnesses than biomedical illnesses (Table 1). In Bénin, percentages of mothers who knew recipes for them ranged from 80% for *atita* to 65% for *ka*. In Gabon, over two-third of all participants knew herbal treatments for common children's folk illnesses. Table 1 also shows that folk illnesses are location-specific. With the exception of fontanels and walk early, Beninese CBS like *atita* and *ka* were unknown to Gabonese mothers, while *fesse rouge* and *la rate* were not known in Bénin. Although the terms and perceived causes of *atita* in Bénin and fesse rouge in Gabon do not coincide, the two folk illnesses were somewhat similar in description. The CBS *pogha* was only mentioned as an illness by mothers in the Gabonese department of Ngounie.

Table 1 Children's health issues treated with medicinal plants by mothers in Bénin and Gabon

Health Issue	# species (%) N= 255	#participants[1] (%) N=43	# species (%) N = 179	#participants[1] (%) N=38
	Bénin	Bénin	Gabon	Gabon
respiratory-related	53 (21)	42 (98)	49 (27)	32 (84)
diarrhea	39 (15)	41 (95)	27 (15)	34 (89)
malaria	54 (21)	41 (95)	36 (20)	33 (87)
intestinal cleanse *	58 (23)	41 (95)	31 (17)	33 (87)
measles	34 (13)	37 (86)	17 (9)	30 (79)
strengthener *	59 (23)	40 (93)	21 (12)	22 (58)
fontanels *	31 (12)	35 (81)	23 (13)	28 (74)
post-circumcision	32 (13)	37 (86)	14 (8)	21 (55)
walk early *	22 (8)	28 (65)	17 (9)	29 (76)
umbilical cord	13 (5)	32 (74)	12 (7)	24 (63)
convulsions/crisis*	32 (13)	33 (77)	4 (2)	4 (10)
teething	25 (10)	30 (70)	2 (1)	4 (10)
anti-sorcery *	21 (8)	25 (58)	6 (3)	6 (16)
fever	37 (15)	19 (44)	14 (7)	7 (18)
atita *	31 (12)	35 (81)	-	-
*ka**	26 (10)	29 (67)		-
fesse rouge *	-	-	26 (15)	28 (74)
*la rate**	-	-	34 (19)	26 (68)
*pogha**	-	-	10 (6)	6 (16)

[1]Percentage of mothers from each country who knew at least one herbal recipe
*Folk illness or treatment

Health-seeking behaviors of Beninese mothers

Although there was little consensus on one preference for healthcare (Table 2), Beninese women generally reported starting to treat their children with medicinal herbs, following up with biomedical care, and seeking traditional healers as a third resort. An 80-year old Mina woman said "Traditional medicine is first. Some use the hospital first, for example for fever or if one needs blood. A traditional healer is called upon to consult the *fa* (oracle) and for sacrifices." Women who reported to never consult traditional healers mentioned the church and prayer as spiritual forms of treatment. Self-administered herbal medicine was reported to be preferred for treating children's illnesses due to its ability to help defecate well, its use as preventative medicine, and its perceived effectiveness. Respondents often mentioned using plants to self-treat for a certain number of days (ranging from two days to one week) and then seeking biomedical care. Biomedicine was acknowledged to have the advantage of having advanced technology and materials but was perceived as being more expensive. A 36-year old Yoruba woman said, "Traditional medicine is used for constipation and *atita*- those you

can treat at home. Modern medicine is used for difficult cases- they are better equipped. Traditional healers are consulted for superhuman cases because they know more about this domain." Advanced forms of illnesses, especially malaria, were commonly reported to be treated with biomedicine. Seeking traditional healers to treat victims of sorcery and folk illnesses were strong themes. Traditional healers were reported to treat illnesses "that surpass the knowledge of doctors," and for causes such as sorcery or witchcraft. A minority of mothers reported the common folk illnesses as well as asthma, to be "men's knowledge," outside of the maternal domain of skills. It was not clear if men's knowledge meant the specialized knowledge of (male) traditional healers or more generally, fathers in the community. An 80 year old Fon woman said, "First try to treat at home with herbs for a couple of days. If they do not work, go to the hospital. If this does not work, go to a traditional healer. Asthma and fetus health are men's knowledge. *Fontanels* are traditional healers' knowledge."

Table 2 Most frequent responses by mothers to healthcare seeking options question in Bénin (N=43) and Gabon (N=38)

Response	% of mothers Bénin	% of mothers Gabon
Ranking of three health care options		
First choice self-treatment with plants	42	29
First choice biomedicine (malaria, anemia, fever)	16	32
First choice biomedicine (always)	0	21
First choice traditional healer	7	18
Second choice biomedicine	30	13
Second choice self-treatment with plants	0	11
Third choice traditional healer	23	3
Never consult traditional healer	5	11
Healthcare choice for specific cases		
Traditional healer for sorcery	44	5
Biomedicine for advanced cases (malaria, anemia)	35	5
Self-treat with plants for specific illnesses (diabetes, measles, stomachache)	21	13
Self-treat with plants for simple cases (malaria, diarrhea)	28	0
Traditional healer for specific cases (fontanels, paralysis)	12	8
Men for specific illnesses (walk early, asthma)	9	0

Health-seeking behaviors of Gabonese mothers

There was also a large range of responses from Gabonese women (Table 2). Nearly the same number of Gabonese mothers preferred self-treatment as a first form of healthcare as mothers who preferred treating children first with biomedicine. The strongest consensus of women cited specific illnesses, especially malaria, in which they would seek biomedical care directly. A 40-year old Obamba woman said "Use modern medicine for malaria, etc. We're evolved for serious illness. Use traditional medicine if modern medicine doesn't work, or if it's not serious. A *ganga* is outdated, we no longer use them." However, other women favored the consultation of a *ganga,* the spiritual leader of the community, or the *nyembe*, the spirit in a women's secret society in the Ngounie department, in order to know where to treat the illness. This was a reoccurring theme, suggesting a strong the role of spirituality and religion in childcare, especially for folk illnesses. A 50 year old Fang woman said, "One should seek modern medicine for an operation; injections go straight to the blood and therefore work faster... Traditional medicine depends on God's grace; prayer helps too. Go to a *ganga* for sorcery." We found a reoccurring theme among Gabonese mothers that three systems were largely complementary. A 42-year old Fang woman said: "Try traditional medicine, if it does not work, the *genies* (spirits) will tell you to go to modern medicine. Work with the spirits! Between modern medicine and traditional medicine, there is a good collaboration. Gabon is currently in good position between the two systems." A 61-year old Omiene women said "The three systems are complementary; you will find a solution between the three. It also depends on one's belief system; some people are hesitant to go to a *ganga*."

Discussion and Conclusion

Biomedical illnesses and their treatment

The majority of women in Bénin and Gabon knew herbal treatments to treat the top causes of infant mortality: respiratory problems (98%, 84% respectively), malaria (95%, 87%), and diarrhea (95%, 89%). This outcome suggests that traditional medicine, and more specifically mothers' knowledge of plants, is a major factor in the management of these common childhood health ailments. Even though mothers were knowledgeable on treating these illnesses, however, they also distinguished situations where they would seek biomedical care prior to using domestic medicine, such as complicated cases of malaria, anemia, or fever. Studies in other African countries also found that mothers preferred to treat malaria with biomedical care (Montgomery et al. 2006). Only a few mothers mentioned diarrhea specifically as a case that they would seek biomedical care as a first option, suggesting diarrhea is largely treated by mothers with plants as was found in a recent study in Sierra Leone (Bakshi, McMahon, and George 2013). Likewise, respiratory ailments were not specifically mentioned as a case for seeking biomedical care. The high percentage of women who know how to treat these illnesses and the high number of plants attributed to their treatment suggest a parallel recognition of major causes of infant morbidity and mortality between the mothers and the statistics of the WHO, indicating agreement between local and biomedical priorities for children's health. This agreement between medical priorities is not always the case, in a similar study on women's health in Bénin and Gabon, we found that local and biomedical priorities did not coincide (Towns and van Andel 2014).

Folk illnesses and their treatment

Folk illnesses ranked directly after the major biomedical illnesses for children in terms of mothers' medicinal plant knowledge. Our research supports ethnobotanical studies from other parts of the world that have indicated local populations commonly prefer to treat folk illnesses with traditional medicine (Vandebroek 2013; Quinlan 2010; Mathez-Stiefel, Vandebroek, and Rist 2012). While many participants in our study knew herbal remedies to treat folk illnesses, it is clear that traditional healers and religion have a strong role in this domain. Men, more generally speaking, were also regarded as having specialized knowledge in Bénin. Fathers also have a role in the treatment of children's illnesses, in terms of their own knowledge of medicinal plants (McDade et al. 2007) and their role in family decision-making (Montgomery et al. 2006).

Folk illnesses are of interest to biomedical health care providers, not only because they often make up a significant portion of local health complaints (Vandebroek 2013) but they may address underlying neglected diseases. Fontanels are common children's folk illnesses around the world, and in other African countries such as Swaziland, Zimbabwe, Botswana and Malawi (Kay 1993). Certain (bulging or sinking) appearances of the fontanels may be symptoms of a range of disorders from dehydration to malnutrition to Down Syndrome (Kiesler and Ricer 2003). Moreover, when mothers apply paste on the fontanel prior to arriving at the hospital, doctors cannot assess the fontanel very well (because of the plant pomades) and may misdiagnose the child's illness. *La rate* resembles the symptoms of sickle-cell disease, a common yet neglected illness of children in Western Africa (Grosse et al. 2011), especially its characteristic concentrated pain on the left side and spleen enlargement (Meier and Miller 2012). This overlap is a fertile ground for improved research and educational programs on sickle cell disease (Makani, Williams, and Marsh 2007). Enemas for intestinal cleanses, especially for newborns and small children, were a common practice in both countries. In the Ivory Coast, Gottlieb (Gottlieb 2004) found that enemas were used to make a baby defecate at a given time. Biomedical research has highlighted the danger in using enemas, especially among young children (Bland et al. 2004).
Even if these illnesses are not recognized as biological in nature, their treatment nevertheless has consequences, either positive or negative, on children's health. Taking local perspectives and treatments

into account not only informs biomedicine of cultural concepts of illness and healing (Etkin 1998), it also facilitates an understand of plant' effects through pharmacological studies (Reyes-García 2010), and enables an understanding of how traditional systems of healing and biomedicine are already interacting on the ground (Langwick 2011).

Complementarity of three systems

The lack of any one definitive pattern of healthcare-seeking behavior among mothers in our study reflected the truly pluralistic healthcare systems of both countries (van der Geest 1997), the dynamic process of deciding how to care for children (Colvin et al. 2013), and the fact that mothers see the three African systems of healthcare as largely complementary. Mothers' general *pattern of resort* (Ryan 1998) was to self-treat with plants first, seek biomedical care for specific illnesses or as a second source of healthcare and to consult the spiritual realm, including *ganga*s and the *nyembe* in Gabon, to treat folk illnesses. However, as found in a recent study in South Africa (Friend-du Preez, Cameron, and Griffiths 2013), this pattern varied according to illness; each healthcare option was seen to have specific advantages and disadvantages. Biomedicine was perceived to have the advantage of advanced technology and materials, especially for treatments related to blood transfusions. Some mothers in Bénin reported a preference of using self-collected herbal medicine over biomedical care due to the expensive of modern treatment.

Future research can take demographic and socio-economic data into account to further the understanding of preferences for childcare treatment (Bakshi, McMahon, and George 2013). Infant and child healthcare will be enriched if local knowledge, illness concepts, and medicinal plants fit into a larger framework that studies healthcare from a community perspective (van der Geest 1997), including researchers from outside the biomedical field (Vandebroek 2013). With the Millennium Development Goals concluding in 2015, and the reality that both countries have not met their targets of reducing infant mortality rates (UNDP 2013b; UNDP 2013a), there is a renewed opportunity for infant healthcare initiatives to become more comprehensive.

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Appendix 1

Species cited in 43 childcare questionnaires in Bénin: scientific botanical name, vernacular plant name(s), plant part used, preparation, use category and collection number

Botanical Name	Vernacular Name[a]	Used part	Preparation[b]	Use category[c]	AMT #[d]
Abelmoschus esculentus (L.) Moench	gombo (Fr)	leaves, fruit	HB, EA	newborn, fontanels	NC
Abrus precatorius L	bouchenchen (T), djindjeklendjeman/viviman (F, G)	leaves	E, T, HB	cough, post-circumcision, respiratory problems	297
Acacia cf. *erythrocalyx* Brenan	ewan (N)	stem	HB	walk early	NC
Acacia cf. *sieberiana* DC.	adouwe (G)	leaves	T	teething	NC
Acacia nilotica (L.) Delile	banni (F)	seeds	T	asthma	NC
Acanthospermum hispidum DC.	toba/ahowonglon (F), kpononnou (G), owgboman (N), tchako (T)	leaves, whole plant	D, T, EN	cough, malaria, fever, CBD ka, respiratory problems, walk early	211, 237
Acrostichum aureum L.	sofofo (G)	leaves	T	walk early	428
Adansonia digitata L.	kpassa (F), baobab (Fr),	leaves, bark	HB	premature birth, strengthener	NC
Adenia cissampeloides (Planch. ex Hook.) Harms	akolebodjou (N)	leaves	T	malaria	445
Aframomum melegueta K.Schum.	atakounkui (Y,N)	fruit	HB	measles	NC
Agelaea pentagyna (Lam.) Baill.	ahwahazoun (F,G)	leaves	T	strengthener, stomach ache, intestinal cleanse	NC
Ageratum conyzoides (L.) L.	suyonou (G), legboku (K)	whole plant	T	respiratory problems, fever	430, 530
Albizia cf. *adianthifolia* (Schum.) W.Wight	ayolo (F)	wood	T	asthma	NC
Alchornea cordifolia (Schumach. & Thonn.) Müll.Arg.		leaves	T	CBD atita, convulsions	631
Allium sativum L	l'ail (Fr), aiyo (F,G,N)	stem	D, T, A, HB, EN	convulsions, constipation, intestinal cleanse, measles, CBD atita, diarrhea, fontanels	NC
Allium sp.	ayomanwoniwono (F)		T	constipation	NC
Aloe macrocarpa Tod.	aloes (Fr)	exudate	D	constipation	NC
Alternanthera pungens Kunth	inchako (T), baglon (A)	leaves	EN, T	walk early, anti-sorcery, malaria	236, 239, 490
Amaranthus viridis L.	amadjin (F)	leaves, whole plant	EA	CBD ka, measles	582
Ampelocissus leonensis (Hook.f.) Planch.	adoyo/teple (F), ecama (A)	whole plant	T	cough, malaria	408, 463
Anacardium occidentale L.	kanghougoto (F,G), canjew (T)	bark	T	cough, respiratory problems, asthma, teething, post-circumcision	425,257
Ananas comosus (L.) Merr.	ananas (Fr)	fruit	T	malaria	NC
Annona muricata L.	shapshap (M)	leaves	D	asthma	134
Anthocleista vogelii Planch.	gontoudo (F), goussouedo (G), irakpo (T)	root, wood	T	intestinal cleanse, stomachache, meconium removal, constipation	281

Botanical Name	Vernacular Name[a]	Used part	Preparation[b]	Use category[c]	AMT #[d]
Arachis hypogaea L.	arachide (Fr)	leaves		fetus strengthener	NC
Arecaceae sp.	gueyo (F,G)	leaves	T	walk early	427
Arecaceae sp.	itowonti (A)	seeds		anti-sorcery	477
Argemone mexicana L.	ahondja/wetcheyon (F, G, N, Y), magele (T)	leaves	T, HB, EA	newborn strength, malaria, meconium removal, stomachache, intestinal cleanse, fontanels, fever	233, 492, 609
Asteraceae sp.	atanatebe (T)	leaves	E	constipation	292
Azadirachta indica A.Juss.	neemma/kininma (F), lili (T)	leaves	T, HB	stomach ache, vomiting, malaria, measles, convulsions	274
Baphia nitida Lodd.	susupeyma (F)	leaves, wood	HB, EA	newborn strength, CBD ka	NC
Barteria cf. *nigritana* Hook.f.	okoukou (F,N), okotcho (Y)	bark, leaves	HB	newborn strength, strengthener, premature birth	451
Bauhinia thonningii Schum.	kloma (F), akluema (A)	leaves	EA, T	toothache, strengthener	466, 560
Blighia cf. *sapida* K.D.Koenig	lissekui (F)	seed	E	asthma	NC
Blighia cf. *unijugata* Baker	agbovian (F, G)	bark	T	diarrhea	NC
Boerhavia diffusa L.	kasualee (F)	leaves	HB	CBD ka	467
Bombax cf. *buonopozense* P.Beauv.	aloviaton (F)	exudate, leaves	D, EA	cough, post-circumcision	NC
Bridelia ferruginea Benth.	honssounkuékué (F)	leaves, bark, root	HB, T	CBD atita, strengthener, asthma, walk early, newborn strength, CBD ka, convulsions, post-circumcision	NC
Bryophyllum cf. *pinnatum* (Lam.) Oken	afoman (N), affiman (G)	leaves	T	walk early	NC
Caesalpinia bonduc (L.) Roxb.	agekwin (A,F,G)	seeds, leaves	AT, T	anti-sorcery, CBD atita, newborn strength, intestinal cleanse, constipation	517
Caesalpinia pulcherrima (L.) Sw.	tegbesu (F), orgueil de chine (Fr)	leaves	HB, T	CBD atita, preventative, convulsions, asthma	NC
Cajanus cajan (L.) Millsp.	kulikwun, klema (F), pulema (K), kolo (N, T)	leaves	T, HB	measles	255, 497, 551
Calotropis gigantea (L.) Dryand.	wagashima (A, F, K, M), pbento (F)	leaves	T, D, EA	anti-sorcery, cough, umbilical cord, measles, strengthener, asthma	469
Calotropis procera (Aiton) Dryand.	bambamo (T)	leaves	EA	umbilical cord	285
Capsicum annuum L.	piment (Fr), vavofli-fliman (G)	fruit, whole plant	EN, EA, T	toothache, intestinal cleanse, wounds, convulsions	439
Carica papaya L.	pbema (F), Kpinman (N, Y)	seeds, leaves	T, HB, T, D	malaria, strengthen, constipation, fever	NC
Carissa spinarum L.	aheyhey (F)	whole plant	EA	walk early	NC
Cassia sieberiana DC.	agbilikopao (T)	wood	T	vermifuge	280
Cassytha filiformis L.	agbegbekan (F, G)	whole plant	T, HB	fontanels, strengthener	NC

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Ceratotheca cf. *sesamoides* Endl.	agboma (F)	leaves	EA	fontanels	NC
Chamaecrista mimosoides (L.) Greene	kinafimitche (F,G,N)	whole plant	T	anti-sorcery	NC
Chamaecrista rotundifolia (Pers.) Greene	azima (F)	leaves, whole plant	T	malaria, constipation, newborn strength	NC
Chassalia kolly (Schumach.) Hepper	atindjedo (G), okpao (Y), akpa (N)	root, leaves	T, EA, HB	intestinal cleanse, fontanels, post-circumcision	NC
Chromolaena odorata (L.) R.M.King & H.Rob.	agatou (F, N, T), gueflu (K)	leaves	EA, HB	post-circumcision, fever, headache	251, 448, 499
Citrullus colocynthis (L.) Schrad.	kakanya (T)	leaves	EA	vermifuge	NC
Citrullus lanatus (Thunb.) Matsum. & Nakai	goussi (F,G)	fruit	T	intestinal cleanse, constipation	NC
Citrus aurantiifolia (Christm.) Swingle	cleman (F,G), citron (Fr)	leaves, fruit, root, bark	T, D, E, A, HB	constipation, intestinal cleanse, measles, convulsions, malaria, stomachache, cough, meconium removal, clear throat of newborn, respiratory problems, vomiting	264
Citrus sp.	orange (Fr)	skin from fruit	EA	wounds	NC
Clausena anisata (Willd.) Hook.f. ex Benth.	gbozoun (F), gbossouazowin (G), arukoumbo (T)	leaves	HB, T, E	CBD atita, constipation, newborn strength, umbilical cord, headache, cough	260, 426, 442, 454
Cleistopholis patens (Benth.) Engl. & Diels	honsoungoto (F), housinkoman (G)	bark, leaves	T	constipation, stomachache, teething	NC
Cleome gynandra L.	khaya (M)	leaves	D	yellow fever, earache	139, 486
Cleome viscosa L.	akaya (F), kayasu (M)	leaves	M, HB	teething, walk early	136,604
Clerodendrum cf. *capitatum* (Willd.) Schumach. & Thonn.	weman/wedo (F,G)	leaves, root	T, HB	CBD ka, CBD atita, malaria, fever	NC
Cnestis ferruginea Vahl ex DC.	gbovian	leaves	D, T, HB	diarrhea, measles	209
Cocos nucifera L.	agodo (F, G)	root	T	malaria, constipation, intestinal cleanse	370, 461
Cola millenii K.Schum.	aloviaton (A)	leaves	T	malaria, fever	NC
Combretum cf. *grandiflorum* G.Don	adoucito (F, G, N)	leaves	T	diarrhea, teething	NC
Combretum collinum Fresen.	bodumey (T)	root	D	CBD atita	294
Combretum micranthum G.Don	kinikiniba (F, G, N, Y)	leaves	EA, D, HB, T	measles	NC
Combretum sp.	adouco (F), adoukin (G)	leaves	T, HB	measles, diarrhea, teething, fontanels, anti-sorcery	400, 405
Commiphora africana (A.Rich.) Endl.	feliyimi (G), origi (T)	leaves, branch	T, AT	cough, convulsions	434
Convolvulaceae sp.	eweyeye (G)	whole plant	T	cough	435
Corchorus olitorius L.	crencren (F)	leaves	D	malaria, constipation	NC
Costus afer Ker Gawl.	teteglete (F)	leaves	E	protection against accidents	636

Botanical Name	Vernacular Name[a]	Used part	Preparation[b]	Use category[c]	AMT #[d]
Crateva adansonii DC.	hontonzouzouin (F, G)	leaves, root	HB, T	post-circumcision, CBD ka, anti-sorcery, intestinal cleanse, malaria	135, 613
Crescentia cujete L.	treci (A), ka (F), calebasse (Fr)	fruit, leaves	EA, T	convulsions, CBD ka	489
Crotalaria cf. *retusa* L.	awiyan (F)	leaves	EA	fontanels, post-circumcision	NC
Croton gratissimus Burch.	hèmandédji (F, G), adjekofole (N, Y)	leaves	T, EA, E, HB	anti-sorcery, measles, fever, CBD ka	456
Cucumis metuliferus E.Mey. ex Naudin	gboounon (F)	fruit	T, A	measles	NC
Cyanthillium cinereum (L.) H.Rob.	mayantin (F), houssinkussè (F, G)	leaves, whole plant	EA, D, HB, T	CBD atita, post-circumcision, walk early, premature birth	410, 473
Cymbopogon sp.	timan (F)	leaves	T	malaria	NC
Cymbopogon citratus (DC.) Stapf	citronelle (F, Fr)	leaves	T	intestinal cleanse, strengthener, meconium removal	NC
Cynometra megalophylla Harms	foladgoto (F), bougoto (G)	bark	HB, T	CBD atita, newborn strength	453
Daniellia oliveri (Rolfe) Hutch. & Dalziel	zanlinkpon (F), eweiya (N, Y), inya (T)	resin, bark, leaves	HB, T	anti-sorcery, walk early	286, 462
Dennettia cf. *tripetala* Baker f.	iberi (T)	fruit	EA	umbilical cord	NC
Desmodium velutinum (Willd.) DC.	trèdoavohou (F, G)	leaves	T	asthma, cough, diarrhea, fontanels, teething	415, 468
Dialium guineense Willd.	atituey (M)	leaves	T	malaria	148
Dichapetalum madagascariense Poir.	gbaglo (A, F, G)	leaves	T, HB	malaria, fever, convulsions, measles, CBD ka	NC
Dichrostachys cinerea (L.) Wight & Arn.	badawouin (F)	root	T	measles	NC
Dracaena fragrans (L.) Ker Gawl.	anyama (K)	leaves	EA	ear ache	533
Dysphania ambrosioides (L.) Mosyakin & Clemants	godo (F), azobidi (K)	whole plant, leaves	HB, EA, T	newborn strength, post-circumcision, asthma, fontanels, vermifuge	557
Eclipta prostrata (L.) L.	zoma (F)	leaves	HB, T	post-circumcision, malaria	596
Ehretia cymosa Thonn.	kanbala (F), miyonman (G)	leaves	T	diarrhea, malaria, fever	460
Elaeis guineensis Jacq.	tjotjo (F), huile rouge (Fr), inkiyo (T)	oil from seed	EA, T	wrinkly newborns, fontanels, convulsions, wounds, fever, measles, respiratory problems, umbilical cord	NC
Entada gigas (L.) Fawc. & Rendle	gbagbla (F)	seeds	T, HB	constipation, intestinal cleanse, constipation	418
Erythrina cf. *senegalensis* DC.	pbaklesi (F)	leaves	HB	diarrhea	559
Erythrococca anomala (Juss. ex Poir.) Prain		leaves		teething	495
Eucalyptus sp.	eucalyptus (Fr)	leaves	T, HB	cough, respiratory problems, malaria	NC
Euphorbia hirta L.	anossikan (G)	whole plant	HB	measles	NC
Evolvulus cf. *alsinoides* (L.) L.	droman (G)	leaves	T	teething	NC
Fabaceae sp.	vonsou	seeds	E, EA	diarrhea, fontanels	NC
Ficus cf. *lutea* Vahl	adako (T)	bark	T	diarrhea	NC
Ficus exasperata Vahl	igpi (T)	sap	EA	umbilical cord	252

Botanical Name	Vernacular Name[a]	Used part	Preparation[b]	Use category[c]	AMT #[d]
Ficus sur Forssk.	voma (F), oweyokpoto (F, G), okpoto (Y)	leaves, bark	HB, T	fever, strengthener, premature birth	579
Flacourtia indica (Burm. f.) Merr.	agbonkadjè (F)	leaves, root	T, HB	diarrhea, measles	NC
Flueggea virosa (Roxb. ex Willd.) Royle	tchèkè-tchèkè (F), ayiku (T)	leaves	T, HB, E, D	constipation, strengthener, meconium removal, convulsions, intestinal cleanse, teething, malaria	276, 569
Garcinia kola Heckel	ahowe (F)	seeds	T, HB	newborn strength, intestinal cleanse	NC
Garcinia sp.	ahowé/kola (F)	leaves, seeds	HB, T, E	newborn strength, malaria, anti-sorcery, fontanels, diarrhea	419
Gardenia ternifolia Schumach. & Thonn.	dakplasou (F)	leaves	D	malaria, fetus strengthener	NC
Gladiolus dalenii Van Geel	baka (F)	tuber	E	asthma	NC
Glycine max (L.) Merr.	soja (F)	seeds	D	constipation	NC
Gmelina cf. *arborea* Roxb.	fiofiotin (F)	leaves	T	constipation	NC
Hackelochloa granularis (L.) Kuntze	azosongo (F, G)	whole plant	T	strengthener	NC
Heliotropium indicum L.	kokolosutepadjay (F), koulodin (N)	whole plant	HB, T	fever, CBD atita, CBD ka	447
Heterotis cf. *rotundifolia* (Sm.) Jacq.-Fél.	hèhèman (F)	leaves	T	anti-sorcery, fever, convulsions, malaria, post-circumcision	NC
Hibiscus acetosella Welw. ex Hiern	hungbe (A), yangba (F)	leaves	T	strengthener, malaria	465, 594
Hibiscus sp.	podey (M)	leaves	T	malaria, fever	NC
Hibiscus surattensis L.	kpofin	whole plant	T	anti-sorcery	NC
Hoslundia opposita Vahl	klongble (G)	leaves	HB	strengthener	437
Hygrophila auriculata (Schumach.) Heine	hosugoto (K)	bark	T	asthma	496
Hymenocardia acida Tul.	fefeya (T)	leaves	E	teething	NC
Hyptis suaveolens (L.) Poit.	sonsupeypeyma/koueflou (F), kouloubi (T)	leaves	HB, T, E	fever, mosquito repellant, diarrhea, CBD atita, CBD ka, dysentery	291, 406, 472
Icacina cf. *trichantha* Oliv.	agebebema (F)	leaves	T	diarrhea	NC
Imperata cf. *cylindrica* (L.) Raeusch.	seman (F, G), eweekan (N)	leaves	T	teething, respiratory problems	NC
Indigofera sp.	ahoobey (A)	leaves	T	strengthener, constipation	366
Indigofera sp.	fonvi (F,G,N)	whole plant	T, HB	walk early	429
Jatropha cf. *curcas* L.	babaki (A), ajakpotu (F), eweakporo (N, Y), kitipopo (T)	leaves, branch	T, HB, SB	malaria, fever, intestinal cleanse, convulsions	659
Jatropha multifida L.	wêkêman (F)	leaves	T	CBD atita	403
Jatropha sp.	jatrophado (N)	root	T	respiratory problems	NC
Justicia flava (Vahl) Vahl	tchoutchouglouchou (F, G)	whole plant	E, HB	anti-sorcery, newborn strength, fontanels	633
Kalanchoe crenata (Andrews) Haw.	afaman (F, Y), adodo (T)	leaves	EA, D	umbilical cord, cough	261
Kedrostis foetidissima (Jacq.) Cogn.	tchiyoman (F, G)	leaves	T	convulsions, malaria, fever	NC

Botanical Name	Vernacular Name[a]	Used part	Preparation[b]	Use category[c]	AMT #[d]
Khaya senegalensis (Desv.) A.Juss.	zounsa (F, N), agao (T)	bark, leaves	HB, T, A, EA	newborn strength, walk early, teething, strengthener, convulsions, premature birth, malaria, CBD ka, CBD atita, anti-sorcery, post-circumcision	244, 284
Kigelia africana (Lam.) Benth.	ylanblikpo (F), pando (T)	bark	T, HB	constipation, intestinal cleanse	249, 458, 577
Lagenaria breviflora (Benth.) Roberty	obiri (N, Y)	whole plant, leaves	T, HB	CBD ka	446
Lagenaria cf. sp.	iytrue (A)	leaves	T	cough	NC
Lannea acida A.Rich.	zuzugoto (F), aku (T)	bark	HB, T	walk early, newborn strength, strength	282
Lannea barteri (Oliv.) Engl.	hounman (F)	leaves	T, HB	premature birth, strengthener	NC
Lannea sp.	mangbevide (F)	bark	T	convulsions	NC
Lantana camara L.	hlatchayo (F, G, N, Y)	leaves	T, HB	post-circumcision, diarrhea, CBD atita, CBD ka	404
Lawsonia inermis L.	laliman (F, G)	leaves	T	malaria	NC
Lecaniodiscus cf. *cupanioides* Planch. ex Benth.	ganotun (F, G)	leaves	HB	premature birth	NC
Lippia multiflora Moldenke	yonya (F, G), yeye/tchaga (T)	leaves	T, HB, EA	anti-sorcery, diarrhea, CBD atita, CBD ka, post-circumcision, teething, cough	270, 402
Lycopodiella cernua (L.) Pic. Serm.	hingble	whole plant	T	anti-sorcery, measles, malaria, fever	433
Mallotus oppositifolius (Geiseler) Müll.Arg.	gbenoukan (F), tchnetchne (G), ayaja (T)	leaves, root, bark	HB, T, EA	CBD atita, asthma, meconium removal, teething	243, 436, 452
Mangifera indica L.	amangua houhou (F, N, Y), mangue (Fr)	leaves, bark	T, HB	respiratory problems, fever, strengthener, newborn strength	NC
Manihot esculenta Crantz	manioc (Fr)	root	D	malaria	NC
Melaleuca leucadendra (L.) L.	bpema (F)	leaves	HB	malaria	NC
Merremia tridentata (L.) Hallier f.	abibey (A), tama (F), fakale (G)	leaves, whole plant	T, HB	diarrhea, sores, CBD atita, fontanels, CBD ka	212, 364, 421, 432
Milicia excelsa (Welw.) C.C.Berg	loko (A, F)	exudate	EA	fontanels	NC
Millettia thonningii (Schum. & Thonn.) Baker	assousouman (F)	leaves	T	malaria	NC
Mimosa cf. *quadrivalvis var. leptocarpa* (DC.) Barneby	boassaman (F)	leaves	T	fontanels	NC
Momordica balsamina L.	kpalari (N)	leaves	T, HB	measles	NC
Momordica charantia L.	yinsikin (F), assossikan (G), tchati (T)	whole plant, leaves	T, HB, A, EA, E	measles, diarrhea, CBD atita, fever, constipation, antibiotic	149, 254, 409, 525
Monodora cf. *tenuifolia* Benth.	sonoufoko (F, G)	seeds	T, HB	walk early, measles	NC

Botanical Name	Vernacular Name[a]	Used part	Preparation[b]	Use category[c]	AMT #[d]
Monodora myristica (Gaertn.) Dunal	sassalinkoun (F)	seeds	EA, T	umbilical cord, post-circumcision, constipation, intestinal cleanse, toothache, preventative	NC
Morinda lucida Benth.	atikeysibey (A), honswuey (K), kwenso (M)	leaves	HB, T, D	convulsions, constipation, intestinal cleanse, fever	133, 365, 537
Moringa oleifera Lam.	kpayêdêdê (F), kpatinman (F, G), batamavi (K)	leaves	DR, T, HB, D	headache, diarrhea, fever, headache, anti-sorcery	NC
Mucuna cf. sp.	feman (F)	leaves	HB	newborn strength	NC
Mucuna pruriens (L.) DC.	dukey (A), ewe agbakila (N)	leaves	A, HB, T	measles, diarrhea	488, 450
Musa sp.	banane (Fr)	leaves	T, D	strengthener, convulsions	NC
Newbouldia laevis (P.Beauv.) Seem.	adama (F), akokoun (F, G, T), desey sigema (M)	leaves, seeds	EA, T, D, HB	post-circumcision, constipation, malaria, newborn strength, fever, anti-sorcery,	279
Nicotiana tabacum L.	azoman (F), taba (N), ayureawe (T)	leaves	T, EA	malaria, convulsions, umbilical cord, fontanels	NC
Ocimum americanum L.	hisihisi (F), fio (G)	leaves, whole plant	EA, T, HB, EN,	sore throats, wounds, asthma, cough, fever, post-circumcision, CBD atita, constipation, meconium removal, newborn strength, diarrhea, fontanels, CBD ka, measles, strengthener	544
Ocimum basilicum L.	akohoun (F, G, Y)	leaves	T, D	constipation	NC
Ocimum gratissimum L.	tchayo (F, G, N), koumoba (T)	leaves, whole plant	T, HB, EA, E, EN	post-circumcision, CBD atita, premature birth, convulsions, walk early, asthma, cough, enema, intestinal cleanse, constipation, meconium removal	272, 498
Ocimum sp.	kessou-kessou (F, G)	whole plant, leaves	T, D, HB	antibiotic, constipation, anti-sorcery, diarrhea, post-circumcision, malaria, newborn strength, fever	NC
Olax subscorpioidea Oliv.	mitindo (F)	root	T	intestinal cleanse, constipation	NC
Oldenlandia cf. *affinis* (Roem. & Schult.) DC.	ahonman (F, G)	leaves	EA, HB	fontanels, premature birth	NC
Opuntia sp.	cactus (Fr)	root, leaves	T	cough	NC
Pancratium trianthum Herb.	kouyoman (F, G)	leaves, stem	T	asthma, cough, anti-sorcery	210, 422
Parkia biglobosa (Jacq.) G.Don	awe (F, G), igba (T)	branch, bark, leaves	HB, T	strengthener, constipation, respiratory problems, convulsions, diarrhea, walk early, anti-sorcery, measles	NC
Passiflora foetida L.	avounyinmitoé (F)	whole plant	T	CBD ka	NC

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Paullinia pinnata L.	ahichan (A), hedoulifi/lokoman (F, G), ganganizema (M)	leaves, root	HB, T	diarrhea, newborn strength, convulsions, post-circumcision, cough	114, 146
Pavetta cf. *crassipes* K.Schum.	gongwako (T)	leaves	T	malaria	NC
Pavetta corymbosa (DC.) F.N.Williams	lohoun (F)	leaves	T	malaria, newborn strength	NC
Pennisetum cf. *glaucum* (L.) R.Br.	mil (Fr)	seeds	E	measles	NC
Pergularia daemia (Forssk.) Chiov.	bonukeykey (A), awinikunsiewa (M)	leaves	EA	fontanels, cough	493
Periploca calophylla (Baill.) Roberty	homa/asobokan (F)	leaves	EA	newborn strength, umbilical cord	475, 583, 608
Persea americana Mil.	avocamanhouhou (F)	leaves	D	asthma	NC
Phyllanthus amarus Schumach. & Thonn.	hlinwhé (F), tehisso (N, Y), aibiso (T)	whole plant, leaves	T	constipation, meconium removal, malaria, newborn strength, intestinal cleanse, vermifuge, diarrhea	NC
Physalis cf. *angulata* L.	korogba (F, N), kongba (Y)	whole plant	T, HB	constipation, CBD ka, CBD atita, measles	NC
Piper guineense Schumach. & Thonn.	pimment du guinea (Fr), injaive (T)	fruit	DR, T, D, EA, HB	headache, CBD ka, CBD atita, fontanels, asthma, strengthener, constipation	658
Plectranthus monostachyus (P.Beauv.) B.J.Pollard	koumoba (T)	leaves	T	constipation	242
Pleurotus tuber-regium (Rumph. ex Fr.) Singer 1951	aisankoum (F)	fungus	E	asthma	601
Portulaca grandiflora Hook.	dri (G)	whole plant	T	teething	NC
Prosopis africana (Guill. & Perr.) Taub.	kakè (F, G)	wood	HB, T	newborn strength, walk early, constipation, fever	401
Pseudocedrela cf. *kotschyi* (Schweinf.) Harms	tchagigi (T)	leaves	T	vermifuge	NC
Psidium guajave L.	kinkouman (F, G, N)	leaves	T, EA, D	diarrhea, post-circumcision, asthma	NC
Psychotria psychotrioides (DC.) Roberty	atindohoussa (F)	bark	HB	post-circumcision	NC
Psychotria vogeliana Benth.	deblago (G)	leaves	T	post-circumcision	414
Pteleopsis suberosa Engl. & Diels	kulikuligoto (F)	bark, leaves	T, HB	CBD atita, CBD ka, newborn strength, measles	NC
Pterocarpus erinaceus Poir.	kosso (G)	bark	T	walk early	NC
Pterocarpus santalinoides DC.	gbengbè (F, G), begbema (M)	leaves	T, HB, D	diarrhea, newborn strength, constipation, CBD atita	138, 634
Pupalia lappacea (L.) Juss.	tredoagbokokui (F)	seeds	EA	fontanels	455
Pycnanthus cf. *angolensis* (Welw.) Warb.	yaya (F)	leaves	T	asthma, cough	NC
Raphia hookeri G. Mann & H. Wendl.	dekui/alitadekoun (F, G)	seeds	T, HB	fontanels	NC
Raphia sp.	ramo (F)	leaves	C	anti-sorcery	NC
Rauwolfia vomitoria Afzel.	vonmansi (G)	leaves	HB, T	fontanels, fever	514

Botanical Name	Vernacular Name[a]	Used part	Preparation[b]	Use category[c]	AMT #[d]
Remirea maritima Aubl.	houyin/housso (F, G)	whole plant	T	teething	417
Rhaphiostylis beninensis (Hook.f. ex Planch.) Planch. ex Benth.	gbagblakan (F, G)	wood	T	newborn strength, constipation, intestinal cleanse	NC
Rhodognaphalon cf. *brevicuspe* (Sprague) Roberty	patindeyhun (F)	leaves	EA	rib/bone displacement	NC
Ricinus communis L.	fefekoupa (T)	leaves	SB, D	fever, stomachache	NC
Rourea coccinea (Schumach. & Thonn.) Benth.	vikplonbaman (G), amedje (N)	leaves	T	post-circumcision, diarrhea	441
Rytigynia senegalensis Blume	gbadema (F, N, Y)	leaves	T, HB	malaria, measles	411
Sansevieria liberica Gérôme & Labroy	kpohiando/kponman (F)	root, leaves	T	malaria, fever	NC
Sarcocephalus latifolius (Sm.) E.A.Bruce	kudo (F), umbesi (T)	root	T	intestinal cleanse, constipation, malaria	NC
Schrebera arborea A.Chev.	fadou (F)	seeds	HB	fontanels	407
Schwenckia americana L.	amankoukui (F)	leaves, whole plant	HB, T	post-circumcision, measles, CBD atita, fontanels	NC
Secamone afzelii (Roem. & Schult.) K.Schum.	zungikusi (F), zougoudou (G), ablengblo (T)	leaves	T, HB, EA, E	convulsions, CBD ka, fontanels, constipation, intestinal cleanse, CBD atita, cough	299, 597
Securidaca cf. *longipedunculata* Fresen.	patado (F)	root	T	asthma, cough	NC
Senna alata (L.) Roxb.	amasou (F), dumadòsogomè (K)	leaves	T, D	intestinal cleanse, constipation, meconium removal	518
Senna hirsuta (L.) H.S.Irwin & Barneby	batomayi (F)	leaves	HB	fever	471
Senna obtusifolia (L.) H.S.Irwin & Barneby	kpanhouman (F)	leaves	EA	umbilical cord, wounds	507
Senna occidentalis (L.) Link	agolikan (F), anajabulo (T)	leaves	T, EA, HB	diarrhea, fontanels, newborn strength, strengthener, convulsions, crisis, fever, malaria	241, 600
Senna siamea (Lam.) H.S.Irwin & Barneby	zangla/cassia (A, F), acacia (G, T)	leaves	T, HB	malaria, constipation	273, 459
Sesamum indicum L.	sesame (Fr)	seeds	E	teething	NC
Sida cf. *rhombifolia* L.	ghema (M)	leaves	EA	toothache	NC
Solanum aethiopicum L.	gboman/gble (F)	leaves	T, HB	diarrhea, post-circumcision	598
Solanum americanum Mill.	moru (T)	leaves	D	cough	262
Solanum dasyphyllum Schumach. & Thonn.	irwawaudi (T)	leaves	HB	teething	240
Solanum lycopersicum Lam.	tomati (F)	leaves	EA	measles, infections, abscesses	NC
Sorghum bicolor (L.) Moench	adako (F)	leaves	T	toothache	NC
Sorghum sp.	hokoveman (G)	leaves	HB	strengthener	438
Spondias mombin L.	akinkoma (F), djogbeman (G)	leaves	T	diarrhea, teething	440, 635
Stachytarpheta cayennensis (Rich.) Vahl	alotrohe (G)	whole plant	HB	premature birth	NC
Stipularia africana P.Beauv.	towedo (F, G)	root, leaves	T	cough, convulsions, malaria, fever	424

Botanical Name	Vernacular Name[a]	Used part	Preparation[b]	Use category[c]	AMT #[d]
Strophanthus hispidus DC.	afeyfey (T)	leaves	HB	malaria	358
Strophanthus sp.	tegbesu (F)	leaves	E, T	convulsions	588
Stylosanthes erecta P.Beauv.	aduma (A, F)	whole plant, leaves	HB, T	teething	464
Syzygium aromaticum (L.) Merr. & L.M.Perry	atinkenbodata (F, G, M, N)	flower buds, bark	D, HB, T, EA	constipation, newborn strength, post-circumcision, umbilical cord, intestinal cleanse, preventative	NC
Syzygium guineense (Willd.) DC.	mlanmi (G)	leaves	T	CBD atita	431
Tectona grandis L.f.	teekma (F, M)	leaves	HB	newborn strength	NC
Terminalia glaucescens Planch. ex Benth.	alotou (F), aloaton (G)	root	T, HB	asthma, cough, post-circumcision, CBD atita, anti-anti-sorcery	NC
Tetrapleura tetraptera (Schum. & Thonn.) Taub.	lindja (F)	fruit	T	asthma	NC
Thonningia sanguinea Vahl	atinmahudè (F, G), oyo (N, Y)	whole plant	T	respiratory problems, asthma, cough, constipation, teething	NC
Tithonia diversifolia (Hemsl.) A.Gray	botowo	leaves	EN, HB	convulsions	278
Trema orientalis (L.) Blume	afere (N, T, Y)	leaves	T, SB	walk early, fever	258
Tribulus terrestris L.	gendarme (F)	whole plant	T	teething	420
Tridax procumbens (L.) L.	kpokpo (G, N, Y)	whole plant	A, T, HB	convulsions, strengthener	478
Triumfetta rhomboidea Jacq.	adjatou (F)	leaves	EA	post-circumcision	NC
unidentified (AMT 141)	weydumey (M)	whole plant	HB	anti-sorcery	141
unidentified (AMT 265)	kanchino (T)	bark	T	diarrhea	265
Uraria picta (Jacq.) DC.	asoinsoin (F)	leaves	T	malaria, respiratory problems, asthma, cough	416
Utricularia cf. *spiralis* Sm.	kologakolesi (T)	leaves	HB	fetus strengthener	NC
Uvaria chamae P.Beauv.	aylahado/aylahaman (F,G, M, N)	root, leaves	T	convulsions, constipation, CBD atita, asthma, malaria, fever, newborn strength	NC
Vepris cf. *verdoorniana* (Exell & Mendonça) Mziray	akode (F,G)	leaves	T	malaria, constipation, intestinal cleanse	NC
Vitellaria paradoxa C.F.Gaertn.	limangoto (F,G), beur de karite (Fr)	seeds, bark	T, EA	cough, respiratory problems, diarrhea	NC
Waltheria indica L.	avoudido (F), avidido (G)	root, whole plant	T	convulsions	423
Xylopia aethiopica (Dunal) A.Rich.	kpedjre (F, G, M, N), arn (T)	fruit, bark	EA, D, T, HB, SB	umbilical cord, intestinal cleanse, constipation, post-circumcision, malaria, toothache, diarrhea, meconium removal, stomachache, fever, strength	NC
Zanthoxylum sp.	atchanhanwou (F), heja (M)	leaves	T	diarrhea, intestinal cleanse, constipation	147, 457

Botanical Name	Vernacular Name[a]	Used part	Preparation[b]	Use category[c]	AMT #[d]
Zanthoxylum zanthoxyloides (Lam.) Zepern. & Timler	hedou (F)	root	T	diarrhea	NC
Zapoteca portoricensis (Jacq.) H.M.Hern.	azonkidjado (F), ingbanu (T)	root	EN, T	intestinal cleanse, convulsions	245
Zea mays L.	mais (Fr)	fruit	T, E	diarrhea, CBD ka, measles	NC
Zingiber officinale Roscoe	dote (F), gingembre (Fr), atalye (T)	rhizome	T, EA, EN, D	asthma, fontanels, intestinal cleanse, constipation	NC

a Local languages are abbreviated: (A)= Adja; (F)= Fon; (Fr)= French; (G)= Goun; (K)= Kotafon; (M)= Mina; (N)= Nago; (T)= Tcha; (Y)= Yoruba.
b Preparations are abbreviated: (A)= soaked in alcohol; (AT) attach; (C)= ceremony; (D)= drink; (DR)= drops; (E)= eat; (EA)= external application; (EN) = enema; (HB)= herbal bath; (M)= massage; (SB)= steam bath; (T)= tea
c Use category abbreviations are as follows: CBD= cultural bound disease
d Botanical voucher number and collector initials; NC= not collected.

Appendix 2

Species cited in 38 childcare questionnaires in Gabon: scientific botanical name, vernacular plant name(s), plant part used, preparation, use category and collection number

Botanical Name	Vernacular Name[a]	Used part	Preparation[b]	Use category[c]	AMT #
Acalypha paniculata Miq.	oekoenkoenakoen (F)	leaves, bark	A	CBD onkoe abijel	NC
Acanthus montanus (Nees) T.Anderson	ndu (F)	leaves	D	cough	NC
Acmella caulirhiza Delile	andongsie/andusi (F)	leaves	DR	fontanels	759, 856
Aframomum citratum (C.Pereira) K.Schum.	adzom (F)	herb	DR, D	umbilical cord, malaria, CBD la rate	NC
Aframomum giganteum (Oliv. & D.Hanb.) K.Schum.	obadzom (F)	leaves	HB	respiratory problems	NC
Aframomum melegueta K.Schum	ondodo/ondon/ndong (F), petite pimment (Fr)	fruit	EN, T, S, E, EA	intestinal cleanse, flu, fontanels, post-circumcision, fontanels	780, 1060, 1275
Aframomum sp.	adzom ebaja/ajom/bisom/eson (F), petite pimment rouge/piment indigiene (Fr)	fruit, leaves, root	EA, M, V, SiB, D, E, EN, HB	fontanels, CBD fesse rouge, fever, CBD la rate, post-circumcision, flu, malaria, CBD pogha, fetus strengthener	1088, 1089
Ageratum conyzoides (L.) L.	ikukwey(F), hedilikii/hedoki/kombavingi (M), etombijoro (Om), mambi matap/ manmibatabe (P)	leaves, root	D, EN, HB	diarrhea, fever, CBD ebem, cough, fever	1054, 1318
Albizia sp.	vovo-esak (F)	whole plant	EN	diarrhea	1228
Alchornea cordifolia (Schumach. & Thonn.) Müll.Arg.	agbuin/nkabi/unsusum abui (F)	leaves	DR, T, SB, EN	toothache, malaria, CBD fesse rouge	1062, 1231
Alchornea floribunda Müll.Arg	alan/alan-bwikili (F)	leaves, root	HB, EN	earache, umbilical cord, intestinal cleanse	1057, 1200
Allium cepa L.	onion (Fr)	stem	M	teething	NC
Alstonia boonei De Wild.	ekouk/kenkina (F)	bark	D, T, E, EN	asthma, malaria, CBD la rate, vermifuge	855
Alstonia sp.	ekok (F)	bark	D	vermifuge	809
Amaryllidaceae sp.	molo mundju (F)	leaves	EA	walk early	NC
Annickia affinis (Exell) Versteegh & Sosef	onvolle/nfo/nfol (F), bois jaune (Fr), mukoka (M), muamba pient (P)	bark, leaves	D, T, E, EA	malaria, fetus strengthener, teething, intestinal cleanse, vermifuge, CBD fesse rouge	1099
Annona muricata L.	corosolle (F), corossolier (Fr)	leaves, bark	SB, D, EN	fever, respiratory problems, fetus strengthener	871
Anonidium mannii (Oliv.) Engl. & Diels	ebom (F)	bark	EN, M	fetus strengthener	NC
Anthocleista cf. *schweinfurthii* Gilg	ajinebe (F)	bark	D, A	diarrhea, CBD onkoe abijel	NC
Arachis hypogaea L.	eba-owun (F), huile d'arachide (Fr)	seed	EA	post-circumcision, fontanels	NC
Asparagus warneckei (Engl.) Hutch.	mincoga mikou (F)	root	DR	fontanels	864
Aucoumea klaineana Pierre	okume/torche indigiene (Fr), okeymone (Om)	bark, resin	D, E, C	diarrhea, anti-sorcery, sores	NC

Botanical Name	Vernacular Name[a]	Used part	Preparation[b]	Use category[c]	AMT #
Baillonella toxisperma Pierre	oabi (B), azap (F), moabi (Fr), oabey (Os)	bark, leaves	T, EN, SiB, HB	CBD fesse rouge, post-circumcision, fever	NC
Bambusa vulgaris Schrad	muguisa	bark	EN	CBD fesse rouge	NC
Barteria fistulosa Mast.	boviongo (B), engokom/ensangom/ nsabre (F)	bark	EN, M, T	walk early, fontanels, respiratory problems	837, 1066, 1303
Berlinia bracteosa Benth.	etodo/eybiara (M)	bark	D	intestinal cleanse	NC
Bidens pilosa L.	biele/oyilee (Ob)	leaves	EA	walk early	1154, 1173
Boerhavia diffusa L.	katakala (Ob)	root	EN	intestinal cleanse	1170
Brideli atroviridis Müll.Arg.	monyombo (B)	bark	T	cough	1269
Brillantaisia lancifolia Lindau	ndolo (F)	whole plant	D	asthma	1252
Camptostylus mannii (Oliv.) Gilg	abumbu/ebubun/ebubung (F)	leaves	HB, A, M, D, EN	respiratory problems, colic, intestinal cleanse, malaria, meconium removal	852
Canna indica L.	ekwanzo (F)	leaves	EC	malaria	1061
Capsicum annuum L	oendodo/okam (F), petite piment/ piment/piment rouge (Fr)	leaves, fruit	EN	colic, CBD fesse rouge, diarrhea, meconium removal, CBD la rate, respiratory problems, fontanels, intestinal cleanse	806
Carica papaya L.	papaya (Fr)	leaves, root	T, SB	malaria, fever	988
Carpolobia alba G.Don	onong (F)	root, leaves	HB, D, S, EC	umbilical cord, fetus strengthener, post-circumcision, cough, CBD la rate, malaria, respiratory problems	779, 1056, 1255
Carpolobia sp.	enong (F)	root	S	post-circumcision	NC
Cecropia peltata L.	assong/asung (F)	bark	EN, D	walk early, meconium removal, cold	1074
Ceiba cf. *pentandra* (L.) Gaertn.	guna (M)	bark	E, D	asthma, CBD la rate	NC
Chaetocarpus africanus Pax	otikancha (Ob)	leaves	EA	fontanels	1157
Cissus cf. *aralioides* (Welw. ex Baker) Planch.	ngun-ele (F)	leaves	EA	fontanels	NC
Cissus cf. *dewevrei* De Wild. & T.Durand	otoektoek (F)	leaves	EA	CBD fesse rouge	860
Citrus aurantiifolia (Christm.) Swingle	alas/olass (F), citron (Fr)	fruit, leaves	D, EN, HB, SB, T, EA, E	malaria, measles, chicken pox, cough, newborn health, asthma, stomachache, CBD la rate, constipation, meconium removal, CBD pogha, CBD fesse rouge, diarrhea,	1059, 1168
Citrus sp. *CF*	canne acid (Fr)		HB	measles	NC
Cleisthopholis sp. *CF*	avum (F)	bark	DR	newborn health	NC
Clerondendron sp.	bejim elok/beyemalol/ebele bejium (F), reine des herbes (Fr)	leaves	EA, A, M	fontanels, CBD onkoe	851

Botanical Name	Vernacular Name[a]	Used part	Preparation[b]	Use category[c]	AMT #
Coffea canephora Pierre ex A.Froehner	café (Fr)	leaves	SB	fever	1158
Cogniauxia podolaena Baill.		root	DR	CBD la rate	1229
Cola cf. *digitata* Mast.	hekoa (M)	bark	HB	measles	NC
Cola sp.	abe/abu (F), kola (Fr)	seed, fruit, bark	S, D, E, EA	post-circumcision, cough, fetus strengthener, fontanels	874
Colocasia esculenta (L.) Schott	taro (M)	bark	D	CBD la rate	NC
Combretum aphanopetalum Engl. & Diels	sissa (F)	leaves	EA	CBD fesse rouge	859
Costus ligularis Baker	mukusa rouge (B)	whole plant	T	cough	1297
Costus sp.	myen (F), canne sauvage (Fr), obong (T)	leaves, stems, whole plant	D, EN, M, EA, SiB, EN, HB, DR, T	asthma, diarrhea, malaria, CBD fesse rouge, CBD la rate, measles, fontanels, CBD bad lungs after birth, chicken pox, fever, respiratory problems	987
Coula edulis Baill.	ohoungou (M)	bark	E	diarrhea	NC
Croton cf. *oligandrus* Pierre ex Hutch	obumba		EN	CBD la rate	NC
Croton mayumbensis J.Léonard	dibamba (B)	bark	HB	fetus strengthener, CBD pogha	1264
Cucumeropsis mannii Naudin	inchoko/jokou (B), concombre traditionelle (Fr), joka (Ob)	seed, stem, leaves	E, V, DR, HB	diarrhea, walk early, growth stimulation, cough, fetus strengthener	NC
Cyathula prostrata (L.) Blume	chatee (B), kolo/kolok (F), oborbe grande feuille (Fr)	leaves, seeds, flowers	E, EA	diarrhea, fontanels	831, 893, 1294
Cylicodiscus gabunensis Harms	odouma (B), edum (F)	bark	D, HB, EN	malaria, vermifuge	1301
Cymbopogon citratus (DC.) Stapf	tisane (F)	leaves	T, EN	malaria, measles	NC
Cymbopogon sp.	citronelle (Fr)	leaves	D, T, SB	malaria	NC
Dacryodes cf.sp.	unguu (B), ebo (C)	bark	E	diarrhea	1278
Daniellia klainei A.Chev.	owengey (B)	bark	HB	CBD pogha	1280
Desmodium adscendens (Sw.) DC.	oborbe petit feuille (Fr)	leaves	EA	fontanels	833
Diodella scandens (Sw.) Bacigalupo & E.L.Cabra	oyemze (F)	leaves	EA, E	toothache, cough	886, 1234
Dioscorea bulbifera L.	bibuma abang (F)	tuber		malaria	1207
Dioscorea sp.	nyam (F)	tuber	D	CBD la rate	NC
Distemonanthus benthamianus Baill	eyem (F)	bark, leaves	HB, D, E	newborn health, fetus strengthener, fontanels	NC
Dracaena fragrans (L.) Ker Gawl.	alen-okpo (F)	bark	EN	walk early	1235
Duboscia cf. *macrocarpa* Bocq.	abak (F)	leaves	EN	walk early	NC
Dysphania ambrosioides (L.) Mosyakin & Clemants	ontchoutchoulou (Ob)	whole plant	SB	malaria	1175
Eclipta prostrata (L.) L.	ivainamoye (B), movindera/oyira (Os)	whole plant, leaves	EA, M	CBD fesse rouge, fever, hemorrhoids	1167, 1273, 1403

Botanical Name	Vernacular Name[a]	Used part	Preparation[b]	Use category[c]	AMT #
Elaeis guineensis Jacq.	esong/onbonmiban (F), huile de palme (Fr)	heart, fruit, seeds	E, EA, M	fetus strengthener, fontanels, CBD la rate, heat rash, post-circumcision, sores, intestinal cleanse, meconium removal, umbilical cord, CBD fesse rouge, measles	NC
Eleusine indica (L.) Gaertn.	alekinedou (Om)	root	M	CBD la rate	1164
Emilia coccinea (Sims) G.Don	mungusungusu (B), alanopo/olonvoe (F)	leaves, whole plant	D, EC, HB, EA	measles, newborn health, umbilical cord, walk early, CBD fesse rouge, meconium removal	1247, 1285
Erythrina droogmansiana De Wild. & T.Durand	esoesoek/esok (F)	bark	M, EN, D, C	CBD la rate, anti-sorcery	881
Ficus exasperata Vahl	ako (F)	bark	EA, D	umbilical cord, cough, fetus strengthener	1239
Ficus mucuso Welw. ex Ficalho	ekoko/ekokok (F)	leaves	EN	colic, meconium removal	NC
Fleroya cf. *ledermannii* (K.Krause) Y.F.Deng	otzeyzam (F)	bark	M	CBD bad lungs	NC
Geophila afzelii Hiern	koudou/kudu (B)	whole plant, leaves	V, EA	CBD la rate	1308
Gossypium barbadense L.	coton (F)	leaves	D	asthma	NC
Guibourtia tessmannii (Harms) J.Leonard	oveng (F)	bark, resin	HB, C	newborn health, anti-sorcery	NC
Harungana madagascariensis Lam. ex Poir.	atuin (F)	bark, leaves	SiB, EN, DR, HB,	post-circumcision, diarrhea, CBD fesse rouge, post-circumcision, intestinal cleanse, CBD la rate, measles	778
Heterotis decumbens Jacq.-Fél.	sangancho (Om)	leaves	T	malaria	1166
Hibiscus acetosella Welw. ex Hiern	esang (F), l'oseille (Fr)	flower	M	CBD fesse rouge	885
Hibiscus sp.	osaill (F), ozai (Os)	leaves, whole plant	EA, V	fontanels, walk early	NC
Irvingia gabonensis (Aubry-Lecomte ex O'Rorke) Baill.	mangue sauvage (Fr), muebe (P)	bark, leaves	M, D	CBD la rate, fetus strengthener, fever	NC
Jatropha gossypiifolia L.		leaves	T	asthma	1159
Kalanchoe crenata (Andrews) Haw.	ivivuma (F), odiokiya (M), landunga (Ob), edokia (Os), majujuga (P), jejoujuga, jewa (T)	leaves, whole plant	D, DR, EA	respiratory problems, cold, ear disorders, umbilical cord, antibiotic, cough, flu	758, 979
Lantana camara L.		leaves	T	malaria	1188
Laporteaaestuans (L.) Chew	tak-akun (F)	whole plant	SB	premature birth	1244
Lasianthera africana P.Beauv.	mundungu (B)	bark	HB	growth stimulation, strengthen fetus	NC
Leea guineense G.Don	mbala (Om)	bark	D	fetus strengthener	NC
Leguminosae cf. sp.	rekoa (B)	bark	D	malaria	1265
Leptactina mannii Hook.f.	ewas wasakulu (F), bois des os (Fr)	bark, leaves	HB, D	growth stimulation	814
Lygodium cf. *microphyllum* (Cav.) R. Br.	nzalanu (F)	leaves	E	diarrhea	NC
Macaranga barteri Müll.Arg.	echemey (B)	bark	T	walk early	1288
Macaranga saccifera Pax	mopoapoa (B)	bark	HB	fetus strengthener, CBD pogha	NC

Botanical Name	Vernacular Name[a]	Used part	Preparation[b]	Use category[c]	AMT #
Macaranga spinosa Müll.Arg	macaranga/mungembe (B), lasass (F)	leaves, bark	EC, EN, T	malaria, walk early, meconium removal, respiratory problems	1064
Maesopsis eminii Engl.	enkangalle (F), mangobey (M)	bark	D, EN, T, HB	cough, CBD fesse rouge, malaria, CBD la rate, CBD pogha	NC
Mangifera indica L.	endok (F), mangue (Fr)	leaves, bark, root	T, SB, EN, D	malaria, hemorrhoids, diarrhea, fever, CBD fesse rouge	NC
Manihot esculenta Crantz	menza (F), manioc (Fr), ayaga (Ob)	leaves, tuber	EA, HB, D, EN,	measles, chicken pox, fetus strengthener, intestinal cleanse	NC
Maprounea membranacea Pax & K.Hoffm.	baobao (Fr)	leaves	D	walk early	1348
Melia azedarach L.	kadunga (Ob)	leaves	T	malaria	1169
Millettia gagnepainiana Dunn	fe-enziee (F)	liana	HB	umbilical cord	NC
Millettia mannii Baker	diperie (M), vinekwey (F)	bark, liana	D, A	intestinal cleanse, meconium removal, newborn	NC
Mimosa cf. *diplotricha* Sauvalle	ebata (B)	leaves	V	respiratory problems	1196
Momordica cf. *foetida* Schumach.	eyenzum (F)	whole plant	EN	CBD ebem	NC
Momordica charantia L.	mabubulu (M), mabunbula (P)	leaves	D, EN, HB	colic, diarrhea, intestinal cleanse, crisis, measles, intestinal cleanse	NC
Morinda lucida Benth.	akong (F)	bark	D, EN, T, HB	intestinal cleanse, CBD la rate, malaria	858, 1213, 1214
Musa sp.	banna (B), anginve/atoran/elat- onton-ekon/enbok-ono (F), bannane (Fr), makokodo (Os)	leaves, fruit, root	EN, M, D, EA, HB, SB, T, E, A	convulsions, CBD fesse rouge, CBD la rate, cough, umbilical cord, fetus strengthener, meconium removal, malaria, diarrhea, post-circumcision, fontanels, vermifuge	NC
Musanga cecropioides R.Br. ex Tedlie	enseng (F)	bark	EN	CBD ebem	NC
Myrianthus arboreus P.Beauv.	angokon/ekokom/enkokun-mieng (F)	bark, fruit, leaves	EA, DR, E, D, EN, EC	fontanels, food, fetus strengthener, walk early, diarrhea, malaria	NC
Myrianthus serratus (Trécul) Benth.	afulum (F)	whole plant	HB	newborn health	1251
Newbouldia laevis (P.Beauv.) Seem.	l'izop (Fr), ovendo (Om),	bark, leaves	D, HB	cough, good luck	1187
Nicotiana tabacum L.	tabac (Fr)	leaves	EA, M, EN	CBD fesse rouge	NC
Nymphaea lotus L.	otoeto (F)	leaves	EN	respiratory problems	NC
Ocimum americanum L.	ocim (F)	whole plant, leaves	DR, EA	earache, walk early	NC
Ocimum gratissimum L.	massep (F), aduma duma (Ob)	whole plant, leaves	T, EA, D, EN, M, HB	cold, cough, fever, toothache, CBD fesse rouge, diarrhea, intestinal cleanse, umbilical cord	1072, 1160, 1172
Ocimum sp.	ndzip (F), ndiandzi (P)	leaves, whole plant	D, EN	cough, malaria, intestinal cleanse	NC

Botanical Name	Vernacular Name[a]	Used part	Preparation[b]	Use category[c]	AMT #
Oryza sativa L.	riz (Fr)	seed	E	diarrhea	NC
Palisota cf. sp.	injokou (B)	leaves	HB	growth stimulation	1290
Panda oleosa Pierre	afan (F)	bark	EN	intestinal cleanse	NC
Parinari excelsa Sabine	otcha (B)	bark	HB	CBD pogha	1281
Passiflora foetida L.	matuka makari (P)	leaves	D	newborn health, diarrhea	NC
Pennisetum cf. *glaucum* (L.) R.Br.	wunzuku (P)	leaves		newborn health	NC
Pentaclethra cf. *eetveldeana* De Wild. & T.Durand	tzi (F)	whole plant, bark	DR	colic, intestinal cleanse	NC
Pentaclethra macrophylla Benth.	ebeng/nzesé (F), mpandzi (M), ompie (T)	bark, wood, seeds	M, EN, D	CBD la rate, asthma, fetus strengthener	834, 1077
Perichasma laetificata Miers	tsigue (F)	leaves, stem	EN, A, D	diarrhea	810, 832, 863
Persea americana Mill.	afia (F)	bark		toothache	1078
Phaseolus vulgaris L.	haricot (F)	leaves	D,HB	measles	NC
Phyllanthus amarus Schumach. & Thonn.	kunguh (F)	whole plant	T	flu	1053
Phyllanthus sp.	kanguh (F)	whole plant	T	diarrhea	1245
Picralima nitida (Stapf) T.Durand & H.Durand	dumavendo (B), ansongomo (F), dirundu (M)	bark	D, EN	asthma, CBD la rate, malaria	NC
Piper umbellatum L.	abomanzan/obadzom (F), malemto (P),	leaves, whole plant	EA, EN, HB	hemorrhoids, post-circumcision, intestinal cleanse, growth stimulation, measles	877, 1246
Piptadeniastrum africanum (Hook.f.) Brenan	miso-miso/tum (F)	bark	EN	CBD la rate	816a
Plagiostyles africana (Müll.Arg.) Prain	esula (F)	bark	HB	newborn health	NC
Portulaca oleracea L.	afosi (F), oyabi (Ob)	whole plant	SB, E	premature birth, sores	1176
Pseudospondias longifolia Engl.	ofoss (F)	fruit	E	kids' food	1081
Psidium guajava L.	guave (F)	leaves	D, T, SB	diarrhea	NC
*Psydrax*cf. *palma* (K.Schum.) Bridson	colera (F)	herb	EA	fontanels	NC
Pterocarpus soyauxii Taub.	motobo (B), esi/umbey (F), kaolin rouge (Fr), motomba/padouk (M)	wood, bark	SM, S, EA, HB, D, EN	post-circumcision, fontanels, measles, chicken pox, umbilical cord, fontanels, walk early, crisis, respiratory problems, diarrhea	NC
Pycnanthus angolensis (Welw.) Warb.	ecombo/muchoko (B), etong (F), otchokou (M)	bark, leaves	T, M, D, EN, SiB, HB	respiratory problems, fontanels, excessive salvia, cough, CBD fesse rouge, CBD pogha	1076, 1090, 1195, 1284
Quassia africana (Baill.) Baill.	izien iral (M)	root	D	malaria	895
Rauvolfia mannii Stapf	obaton (F)		E, D, T	malaria, CBD la rate	NC
Ricinodendron cf. *heudelotii* (Baill.) Heckel	essessa (F)	leaves	D	fetus strengthener	NC

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Saccharum officinarum L.	enkok (F), canne sucre (Fr)	whole plant, stem	D, T, E	asthma, flu, malaria, meconium removal	NC
Sacoglottis gabonensis (Baill.) Urb.	ozohgo (B)	bark	EA	CBD la rate	NC
Sarcocephalus latifolius (Sm.) E.A.Bruce	ebohwey (Os), ondolo (T)	root, bark	D	malaria, anti-sorcery	1404
Scleria boivinii Steud.	zengey (B, M), fofolou (F), laim sauvage (Fr), kengitsie (P)	leaves, whole plant	DR, EA	umbilical cord	1199
Scoparia dulcis L.	mnserè (F), ogandarga (Om)	leaves, whole plant	D, TP	vermifuge, walk early	830, 1165
Scorodophloeus zenkeri Harms	kaakey (B)	bark	HB	CBD pogha, fetus strengthener	NC
Senna alata (L.) Roxb.	moviovo (B), dowlontou (F), kinkiliba (Fr), kangadiba (M), angare/oumara (T)	leaves	D, EA, EN, T	stomachache, blisters, diarrhea, CBD fesse rouge, malaria, constipation, meconium removal	1210, 1320
Senna occidentalis (L.) Link	besi (F), ngari (Ob)	whole plant, leaves	EN, EA	CBD la rate, skin diseases	1055
Sesamum radiatum Schumach. & Thonn.	mokoka (Os)	leaves	HB	fever	1405
Sida acuta Burm.f.		whole plant	M	walk early	NC
Solanecio angulatus (Vahl) C.Jeffrey	budiambu	leaves	D	crisis	NC
Solanum americanum Mill.	otchango (M)	leaves	D	cough, fetus strengthener, fever	1323
Spathodea cf. *campanulata* P.Beauv.	evuvum (F)	leaves	DR	cough	NC
Staudtia kamerunensis var. gabonensis (Warb.) Fouilloy	oghobey (C)	bark		cough	1256
Streptogyna cf. *crinita* P.Beauv.	bongi (M)	whole plant	E	diarrhea	NC
Tabernanthe iboga Baill.	bois sacre (Fr)	root	D	fetus strengthener, anti-sorcery	NC
Telfairia cf. *pedata* (Sm. ex Sims) Hook.	ayuzum (F)	leaves	D	colic, meconium removal	NC
Terminalia catappa L.	huile d'almande (Fr)	seed	EA, M	fontanels, post-circumcision, measles, fever, CBD fesse rouge	NC
Tetracera sp.	nzrnzu (F)	wood	D	fetus strengthener	NC
Tetrapleura cf. *tetraptera* (Schum. & Thonn.) Taub.	ozara (B)	bark	HB	CBD pogha	1302
Tetrorchidium didymostemon (Baill.) Pax & K.Hoffm.	nzili (F), ngoumou (Ob)	leaves, bark	D, EN	colic, constipation, meconium removal, vermifuge	1171, 1202
Thomandersia congolana De Wild. & T.Durand	umbazal (F)	root	D	fetus strengthener	1253
Tithonia diversifolia (Hemsl.) A.Gray	margarit (F)	leaves, whole plant, flower	EN, EA, HB, M	CBD la rate, intestinal cleanse, malaria, measles, CBD fesse rouge	862
unidentified (AMT 1087)	inziga kusu (F)	liana	D	lung cleanse	1087
unidentified (AMT 1243)	anyang (F)	whole plant	SB	premature birth	1243

Botanical Name	Vernacular Name[a]	Used part	Preparation[b]	Use category[c]	AMT #
Vernonia amygdalina Delile	bikambilar/joloyolo/zomalyo (F), kongobulubu/ondole (Ob), kungubulu (T)	leaves, bark	EN, D, HB, EC	intestinal cleanse, toothache, vermifuge, CBD la rate, measles, malaria, chicken pox	807, 980, 1070, 1153, 1174
Vernonia conferta Benth.	abanga/abankak (F)	bark	T, D	diarrhea	1071, 1201
Vernonia sp.	mopotopoto (B)	whole plant		CBD la rate	1257
Vitellaria paradoxa C.F.Gaertn.	berre de carite (Fr)	seed	M	CBD la rate	NC
Xylopia aethiopica (Dunal) A.Rich.	bikwin (F)	fruit	S	post-circumcision	NC
Zanthoxylum cf. *heitzii* (Aubrév. & Pellegr.) P.G.Waterman	olom (F)	bark	D	asthma	NC
Zea mays L.	mais (Fr)	fruit	EA, HB	measles	NC
Zingiber officinale Roscoe	gingembre (Fr), maketa (Om)	rhizome	D, EA, EN, V	cough, CBD fesse rouge, respiratory problems	NC

a Local languages are abbreviated: (B)= Babungu; (C)= Commercial timber name; (F)= Fang;(Fr)= French; (M)= Mitsogo; (Ob)= Obamba; (Om)= Omiene; (Os)= Ossimba; (T)= Teke

b Preparations are abbreviated: (A)= attach; (C)= ceremony; (D)= drink; (DR)= drops; (E)= eat; (EA)= external application; (EC)= encircle; (EN) = enema; (HB)= herbal bath; (S)= spit; (SB)= steam bath; (SiB)= sit bath; (SM)= envelop in smoke; (T)= tea; (TP)= tap on feet; (M)= massage; (V)= vaccination

c Use category abbreviations are as follows: CBD= cultural bound disease

d Botanical voucher number and collector initials; NC= not collected.