Chapter Five

Volume, value and floristic diversity of Gabon's medicinal plant markets

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Abstract

Ethnopharmacological relevance

African medicinal plant markets offer insight into commercially important species, salient health concerns in the region, and possible conservation priorities. Still, little quantitative data is available on the trade in herbal medicine in Central Africa. The aim of this study was to identify the species, volume, and value of medicinal plant products sold on the major domestic markets in Gabon, Central Africa.

Materials and methods

We surveyed 21 herbal market stalls across 14 of the major herbal medicine markets in Gabon, collected vouchers of medicinal plants and documented uses, vernacular names, prices, weight, vendor information and weekly sales. From these quantitative data, we extrapolated volumes and values for the entire herbal medicine market.

Results

We encountered 263 medicinal plant products corresponding with at least 217 species. Thirteen species were encountered on one-third of the surveyed stalls and 18 species made up almost 50% of the total volume of products available daily, including the fruits of *Tetrapleura tetraptera* and seeds of *Monodora myristica*. Although bark comprised the majority of the floristic diversity (22%) and the highest percentage of daily stock (30%), the resin of IUCN red-listed species *Aucoumea klaineana* represented 20% of the estimated daily volume of the entire herbal market. Plants sold at the market were mainly used for ritual purposes (32%), followed by women's health (13%), and childcare (10%). The presence of migrant herbal vendors selling imported species, especially from Benin, was a prominent feature of the Gabonese markets.

Conclusion

An estimated volume of 27 tons of medicinal plant products worth US$ 1.5 million is sold annually on the main Gabonese markets. *Aucoumea klaineana* and *Garcinia kola* are highlighted as frequently sold species with conservation priorities. The herbal market in Gabon is slightly higher in species diversity but lower in volume and value than recently surveyed sub-Saharan African markets.

Keywords

Non-timber forest products (NTFPs); informal economy; Central Africa; trade; herbal medicine; plant conservation

Introduction

The role of medicinal plants as non-timber forest products (NTFPs) in Africa has been well established in conservation, ethnobotany and sustainable development literature (Cunningham, 1993; Gaoue and Ticktin, 2007; Shackleton and Shackleton, 2004; Ticktin, 2004). The sale and trade of these plants form part of the informal economy of many African countries and contribute to the economic wellbeing of plant vendors, many of whom are women (Dold and Cocks 2002; Quiroz et al. 2014; Jusu and Sanchez 2013). Medicinal plants make substantial contributions to the income of plant vendors involved in the industry as well as to the health of consumers; the majority of sub-Saharan African populations use traditional medicine to meet their healthcare needs (Anyinam 1995). This pattern is prevalent in rural communities, where health clinics are often poorly equipped (Pouliot 2011), but also in urban centers, where biomedical treatment is readily available in hospitals and health centers (Cocks and Dold 2006; Osamor and Owumi 2010).

The combined effects of the profitability of medicinal plants, the high demand by local populations, and the fact that most plants are harvested from the wild (Schippmann, Leaman, and Cunningham 2002) have contributed to the concern that commercialized species may be overexploited resources. In several African countries, there is evidence that the commercial harvest of herbal medicine to meet a growing urban population has become an environmentally destructive activity (Cunningham, 1993; Dold and Cocks, 2002). Market sellers in Western Africa have been shown to use a larger variety of plants and more vulnerable species than harvesters who collect plants for personal use (Towns et al., 2014), suggesting that studying the medicinal plant trade is useful in investigating the exploitation of wild plants of a larger area (Cunningham, 2001; Williams, Witkowski, and Balkwill, 2009). Studying the medicinal plant market can contribute to improved decision-making in sustainable land-use management and livelihoods (Jusu and Sanchez 2014).

Before focused efforts can be made on estimating the effect of commercial plant harvesting on the surrounding vegetation, baseline figures are needed on the species, value, quantities, and characteristics of the marketplaces in question. Recently, quantitative surveys of herbal markets have become available for African countries, including South Africa (Dold and Cocks, 2002; Williams, Balkwill, and Witkowski, 2000; Williams et al., 2009), Tanzania (McMillen 2008), Morocco (El-Hilaly, Hmammouchi, and Lyoussi 2003), Benin (Quiroz et al. 2014), Ghana (van Andel, Myren, and van Onselen 2012) and Sierra Leone (Jusu and Sanchez 2013). Much less information, however, is available on markets in the Central African region, including Cameroon (Betti 2002) and Equatorial Guinea (Ondo 2001). Gabon is of special interest to conservation given its unique biodiversity (Olson and Dinerstein 1998) and its current ranking as the country with the highest rate of loss of primary forest in Africa (FAO 2010c), but little information is available on its herbal medicine trade.

In order to fill the gap of knowledge on Gabonese commercialized medicinal plant species, we conducted a market survey in the major cities of Gabon. The aim of our study was to identify the species, volume, and value of medicinal plant products sold domestically on major markets in Gabon. We also sought to identify the most frequently sold species and plant parts and the most salient health concerns treated by plants sold at the market. Given Gabon's lower population density and higher standards of living than other African countries, we hypothesized that the Gabonese medicinal plant markets would be smaller in volume and floristic diversity than those in West Africa, Tanzania and South Africa. The outcomes of this market survey can be used to identify priority species for conservation, contribute to an understanding of the role of medicinal plant sales on the socioeconomic wellbeing of market vendors, and highlight the populations' salient health concerns.

Materials and Methods

Study area

Gabon is located in Central Africa, bordering the Atlantic Ocean to the west, the Republic of the Congo to the east and south, and Equatorial Guinea and Cameroon to the north. Up to 80% of Gabon has been estimated to be covered with forest (Sosef et al. 2006), with approximately 65% considered primary forest and remaining land consisting of swamps, mangroves, and savannas (FAO 2010c). The Gabonese population is around 1.6 million people, mainly of Fang, Bapounou, Nzebi, and Obamba ethnic groups (CIA 2013b).

Data collection took place between June and November 2012, in which we visited major herbal medicine markets in the provinces of Estuaire, Woleu-Ntem, Haut-Ogooué, Ngounié, Moyen-Ogooué, Ogooué-Maritime, and Nyanga. We started our data collection in the capital city of Libreville, visiting the two main medicinal plant markets several times a week to speak with vendors and purchase plant species to be processed into botanical vouchers. This regular contact built up the trust necessary to begin our quantitative market surveys and familiarized us with the most common commercial species, local names, and salient health concerns treated with herbal medicine in Gabon. We then conducted a systematic quantitative survey of 21 market stalls, across 14 markets, in major and regional cities in Gabon: Libreville (pop. 619,000), Port-Gentil (pop. 80,000), Franceville (pop. 56,000), Oyem (pop. 38,000), Lambaréné (pop. 24,000), Tchibanga (pop. 24,000) Fougamou (pop. 4,100), and Cocobeach (pop. 1200) (Fig.1).

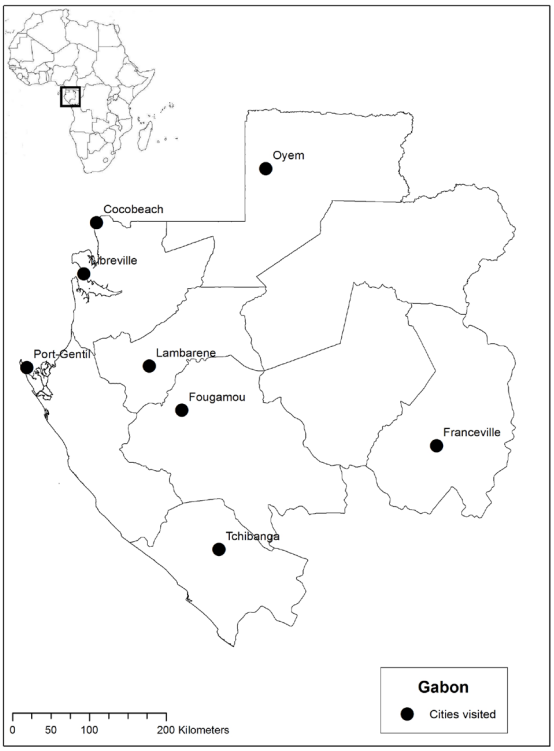


Fig.1 Map of Gabon with market cities visited during our quantitative market survey in 2012.

Quantitative market survey

Following the methodology carried out in market surveys in Ghana (van Andel, Myren, and van Onselen 2012) and Benin (Quiroz et al. 2014) and the guidelines for ethnobotanical market inventories (Cunningham, 2001), we began our quantitative survey by counting the number of herbal medicine stalls at each marketplace (n= 192). We categorized the stalls into five different types: (1) herb stalls (including barks and woody plant parts) (2) spice stalls (with dual purpose food/medicinal fruits and seeds including the palm wine bark *Garcinia kola*); (3) Bwiti stalls (plants used in spiritual practices and ceremonies); (4) ambulant vendors (market vendors on foot), and (5) Beninese herbal stalls (migrants from Benin selling imported plant species). We also collected general data on each market, including type of products sold and number of open days per week.

We then sampled individual stalls by randomly inviting 21 vendors to participate in our market survey. We counted the number of products sold, recorded the price of each product, collected ethnobotanical data of each product (local name, medicinal use, and preparation), tallied the total amount of sales units per stall (bags, bundles, bottles, and individual pieces), and measured each product's weight with a portable digital scale. All plant products recorded for sale are listed in Appendix 1, together with the local and scientific names, plant parts sold, collection numbers, medicinal uses, weights, and prices. We also estimated the total weight of stock in storage. For each surveyed stall, we asked the vendor to estimate his/her weekly sales and to report general information on challenges to selling plants. We also collected basic demographic data from each vendor, including ethnic group, sex, age, and name. Our market survey was part of a larger ethnobotanical inventory on medicinal and ritual plants in Gabon.

Plant collection and identification

For each new species we encountered at the market, we purchased the plant and made botanical vouchers following standard botanical collection methods (Martin 2004). If market samples were too dry or fragmented to be properly identified or lacked fertile plant parts, we later accompanied market vendors into the field to match market specimens with fertile species in the wild. We deposited vouchers at the Herbier National du Gabon (LBV) and exported duplicates to the Wageningen branch of the National Herbarium of the Netherlands (WAG), now part of Naturalis Biodiversity Center (L). We identified the plants using local botanical literature (Flore du Gabon, 1960-2008; Hawthorne and Jongkind, 2006; Raponda-Walker and Sillans, 1961; Sosef et al., 2006;) and the extensive herbarium collections of Gabonese material at Wageningen. Three collections were too difficult to identify with standard botanical keys, two of which were sent to a wood anatomist who utilized microscopic methods and the InsideWood database (InsideWood, 2004-onwards) and one which was identified by DNA analysis following the methodology detailed in Quiroz et al. (2014). We also assessed the conservation status of each species according to the International Union for Conservation of Nature Red List (IUCN Red List of Threatened Species, 2014) and the Convention on International Trade of Endangered Species list (CITES, 2014). Species and author names were updated using the Plant List (www.theplantlist.org). Full names, including authors, of all species are listed in the Appendix 1.

Data analysis

We first calculated the average weight (in kg) and reported price (in US$) of each medicinal plant product. We converted CFA currency prices into US dollars based on the exchange rate at the start of our market survey (US$ 1 = 535 CFA in July 2012). We then totaled the number of sales units of each product sold on the 21 surveyed stalls and calculated the volume (in kg) and monetary value of plant material offered for sale per market stall. We then multiplied these numbers by the number of stalls per marketplace, extrapolating the weight and values to the entire Gabonese market. Average weights were used for those products that we were unable to weigh (183 g for a piece of bark, 144 g for leaves, 104 g for herbs, 101 g for fruits, 78 g for roots, 67 g for wood, and 41 g for seeds). We estimated the price

per kilogram for species for which we did not know the price based on average price per sales unit of purchased products (wood US$ 4.67, roots US$ 3.74, bark US$ 1.85, leaves US$ 1.76, entire plant US$ 1.64, fruit US$ 1.60, seed US$ 1.03, and fungus US$ 0.93). We created a map of the cities visited during the market survey (Fig. 1) in ArcGIS 10.1 using open source geospatial data from DIVA-GIS (http://www.diva-gis.org/).

We performed a Detrended Correspondence Analysis (DCA) in PC-ORD v 5.33 in order to assess the similarity in floristic diversity among the four main stall types (McCune and Mefford 2006). All plant species cited by the 21 vendors were entered into presence–absence data matrices, which identified the two main axes that caused the distribution of the vendors and sold species. We plotted the 1st and 2nd axes in two-dimensional graphs to visualize the variation and overlap in plant species used by different market stalls and the variations in stall diversity between Gabonese and migrant vendors. In order to assess whether we sampled enough stalls, we created species-accumulation curve based on the Shannon diversity index of the number of plant products and species from the sampled market stalls. We calculated Shannon diversity indices in EstimateS version 9.10 (Colwell 2013).

Ethics

Following the Code of Ethics of the International Society of Ethnobiology (International Society of Ethnobiology 2006), we followed all protocols with partner institutions and universities, including the acquisition of formal invitations, research permits, and plant export permits. At each market setting, we carefully explained the nature of our research and obtained prior informed consent from each participant. In addition to purchasing the market plants with which we made botanical vouchers, we also offered financial compensation, equivalent to local norms, for vendors' involvement in the research.

Results

Market characteristics

The 14 markets we visited during our quantitative market survey varied from the large metropolitan markets of Libreville with a variety of spice, herb, and Bwiti stalls to the small village market of Cocobeach with only two spice stalls (Table 1). Out of the 192 stalls we counted, the majority were spice stalls (n= 108), followed by herb stalls (56), Bwiti stalls (16), and Beninese vendors (11). We encountered only one ambulant seller on the main market in Mont Bouët, which was left out of Table 1. The Libreville stalls, with a combined total of 5045 kg of medicinal plant stock, comprised nearly 75% of the total weight of medicine plant products available daily for sale in Gabon (out of the total 192 stalls). Although spice stalls are fairly evenly distributed across the country, Libreville housed the main trade in herbal medicine. Marché Bornave in Port-Gentil housed the most Bwiti stalls out of all the markets we visited. The medicinal plant vendors were largely part of the main markets containing food, fish, clothes, and small sundry items and sold products six or seven days a week. The marketplaces were dominated by female vendors; 90% of the surveyed stalls were managed by women.

Table 1 Characteristics of 14 marketplaces visited during 2012 Gabon herbal market survey.

Location (Market)	Sales frequency (days / wk)	Description	Spice stalls	Herb stalls	Bwiti stalls	Benin stalls	No. of sampled stalls (% of total)	Est. % of total floristic diversity	Total daily stock (kg)
Cocobeach	7	Small village market, border with Equatorial Guinea	2	0	0	0	0	6	17
Fougamou	7	Canned food, sandals, plastic buckets, smoked fish	4	0	0	0	0	6	33
Franceville (Grand Marché Poto-Poto)	7	Fruits, vegetables, bush meat, clothes	7	2	0	0	0	8	135
Lambaréné (Marché Issac)	7	Mainly fish, food	8	0	0	0	0	7	73
Libreville (La Peyrie)	6	Medicinal plants, herbs fresh, sellers harvest on Mondays	0	13	0	0	4 (31)	36	1623
Libreville (Mont Bouët Main Market)	6	Food, clothes	16	0	9	8	4 (12)	13	1030
Libreville (Mont Bouët)	6	Medicinal plants, herbs fresh, sellers harvest on Mondays	0	38	0	0	5 (13)	39	1987
Libreville (Nkembo)	6	Food, fish, clothes	49	0	0	0	4 (8)	6	404
Oyem (Marché Akouokam)	7	Vegetables, fruits, and food	5	0	0	0	1 (20)	6	41
Oyem (Marché Ngouema)	7	Vegetables, fruits, and food	12	1	0	0	2 (15)	15	138
Port-Gentil (Marché Balise)	7	Vegetables, fruit, clothes	0	0	0	3	0	3	19
Port-Gentil (Marché Bornave)	7	Ritual plants	0	0	7	0	1 (14)	11	1050
Port-Gentil (Marché Grand Village)	7	Vegetables, fruit, clothes,	4	0	0	0	0	6	33
Tchibanga (Marché de la Gare Routière)	6	Fresh vegetables, dry fish	1	2	0	0	0	7	86
TOTAL			**108**	**56**	**16**	**11**	**21* (11)**	**100%**	**6807**

*including one ambulant seller

Although 81% of the sampled market stalls were headed by vendors of Gabonese nationality, we also encountered several vendors from other Western African countries, including Benin, Cameroon, Niger, Nigeria, and Togo. Beninese vendors were the most frequently encountered migrants selling herbal medicine. Migrant sellers sold distinct species not marketed by the Gabonese vendors. For example, large quantities of *Afrostyrax* sp. (DQ 1106) fruits reported to be imported from Cameroon were found on a spice stall of a Cameroonian vendor, and imported savanna barks such as *Lannea barteri* and *Pteleopsis suberosa* were observed on the Beninese herbal stalls. In Fig. 2, the 21 stalls are arranged by similarity of species composition. Points that are closely clustered have many species in common. Points that are farther apart have less botanical similarity. Gabonese herb and spice stalls, as well as the migrant spice and Bwiti stalls, were similar in floristic composition. The Togolese spice stall was unique in that it contained only one species, the bark of *Scorodophloeus zenkeri*, which was also found on one herb stall and one additional spice stall. The outlying herb and spice stalls clustered near the x axis have unique species not recorded on other Gabonese stalls. The species and weights counted on each stall are reported in full detail in Appendix 2.The Beninese herbal stall that we surveyed clearly stood out as an outlier among the sampled herb stalls. The Beninese stall sold common species from the Beninese herbal medicine market (Quiroz et al. 2014) not present on Gabonese herb stalls. The ambulant seller was selling only two species, *Annickia affinis*, which was found abundantly on herb stalls, and *Cymbopogon citratus*, which was also commonly sold on the market but not present on the stalls we surveyed.

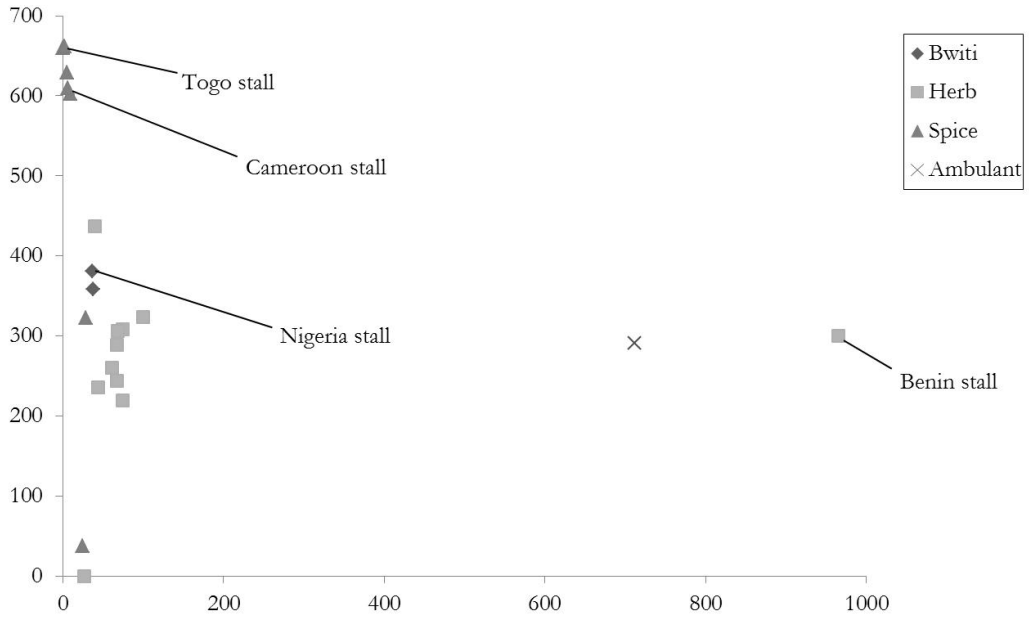


Fig.2. Detrended Correspondance Analysis indicating the similarity in floristic diversity among the four main stall types surveyed in Gabon [Herb (n=11); Spice (n=7); Bwiti (n=2) and Ambulant (n=1)]

Floristic diversity

Over the course of our six month study, we encountered 263 medicinal plant products, belonging to 217 individual species, of which 160 were identified to species level, 36 to genus level, and three to family level (Appendix 1). The remaining 18 remain unidentified to family level due to insufficient sample material. We encountered more plant products than species since many plant parts sold individually were from the same species (for example the resin and bark of *Aucoumea klaineana*). The plant families with the most number of species for sale on the market were Leguminosae (33 spp.),

Rubiaceae (16 spp.), Euphorbiaceae (12 spp.), Annonaceae (11 spp.), Apocynaceae and Malvaceae (10 spp. each), Zingiberaceae (8 spp.), and Asteraceae and Solanaceae (7 spp. each). After sampling 21 stalls, we encountered 66 % (174 out of 263) of the total plant products and 71% of the existing botanical variation (155 out of 217 species). Plant mixtures were excluded from this calculation since they combined many species, most of which were also sold separately. Our sampling represented approximately 10% of the total number of medicine stalls on the 14 marketplaces we visited. Although our accumulation curves (Fig. 3) do not level off completely, the flattening of the line suggests that our sample size was adequate to give a representative overview of the diversity of medicinal plant species and products sold on the marketplaces in 2012.

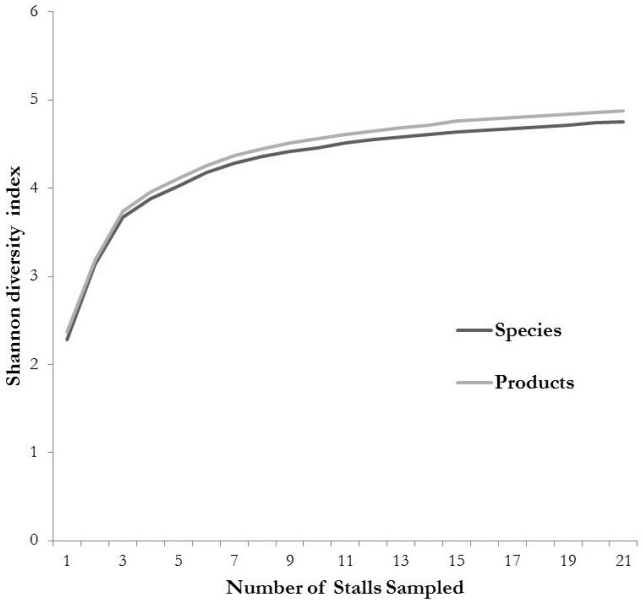
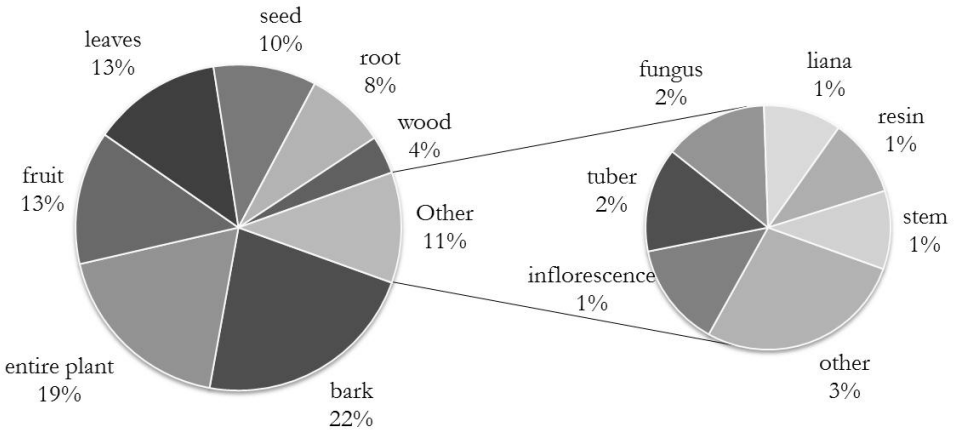


Fig.3. Shannon diversity index cumulative curve for species and products sold on the 21 markets stalls sampled in Gabon (2012).

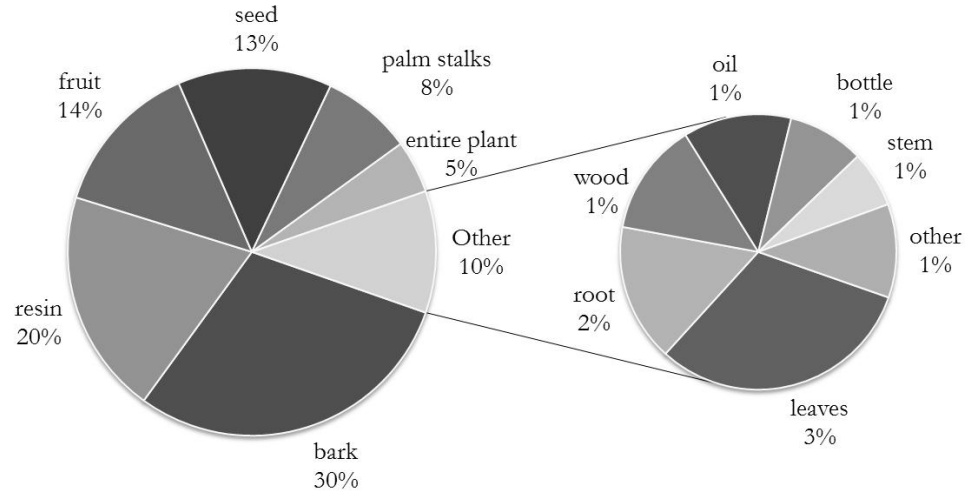
Barks comprised the largest percentage of plant diversity (22%), followed closely by the entire plant (19%), fruits (13%), and leaves (13%) (Fig. 4a). Those plant parts that made up less than 1% of the total (rhizome, branch, oil, palm stalks, fibers) were combined under the heading "other." Bark was also sold in the greatest volume (in kg) on the marketplaces that we visited (30%) (Fig. 4b), followed by resin (20%), fruits (14%), and seeds (13%).

Prices, Frequencies, and Volumes

The average price per sales unit of medicinal plant products in Gabon did not vary greatly (bark US$ 1.85, leaves US$ 1.76, entire plant US$ 1.64, fruit US$ 1.60, seed US$ 1.03, and fungus US$0.93), except for wood and roots that were US$ 4.67 and US$ 3.74 respectively. The most expensive species were found on a Bwiti stall at Marché Bornave in Port-Gentil: the inflorescences of *Streptogyna crinita*, which were sold in very small quantities (1 gram) at the rate of US$ 1869 per kilo, unidentified seed "kandrina" (Bapounou) (AMT 1354), which was sold by piece at the rate of US$ 623 per kilo, and unidentified fruit "kiliguu" (Mitsogho) (AMT 1041), which was sold by piece at the rate of US$ 748 per kilo. It should be taken into account that these products are always sold in very small quantities. The remaining prices of plant products ranged from US$ 359 per kilo for the wood of *Nauclea diderrichii* to US$ 1.25 per kilo for the leaves of *Cymbopogon citratus* (Appendix 1). We calculated the average price of all medicinal plant species sold on the 21 surveyed stalls to be US$ 56 per kilo.



(a)



(b)

Fig. 4. Plant parts sold on herbal markets sampled in Gabon 2012, (a) percentage of the total number of products (n=263), and (b) percentage of daily stock (excluding stock stored behind stalls).

The reported weekly sales varied greatly by market vendors with whom we spoke. The estimated weekly sales figures represented the value of products sold per week but it did not include transportation and collection costs. Therefore, the average income of each market vendor is likely lower than the reported sales. On average, Bwiti stalls reported sales of US$ 327 a week, herb stalls reported sales of US$ 197 a week (with a range of US$ 654 by a wholesale vendor selling mainly barks to US$ 22 a week for a small herb stand), spice stalls reported sales of US$ 131 a week, Beninese vendors reports sales of US$ 56 a week and ambulant sellers reported sales of US$ 6 a week. The relatively higher reported weekly sales of Bwiti stalls may be reflective of the higher price of ritual plants, the possibility that this figure included the sale of animal products (which were generally more expensive than plant products), and/or the basis of the Bwiti calculation on only one vendor (which may not reflect the weekly sales of an average Bwiti vendor). Based on these reported average sales, we estimated the annual value of medicinal plant trade in Gabon to be US$ 1,538,936 in 2012.

The species encountered most frequently in the 21 surveyed market stalls were the fruits of *Tetrapleura tetraptera*, the seeds of *Monodora myristica,* and the resin of *Aucoumea klaineana* (Table 2). Although *A. klaineana* resin was sometimes found to be sold alone, it was typically wrapped in the bark of *Xylopia aethiopica* to form the interior of an indigenous torch used in ceremonies.

Table 2 Species encountered in more than one third (29%) of the 21 surveyed stalls in Gabon 2012.

Species	Freq (%)	Total volume on 21 stalls (kg)	Traditional Use	Habit	IUCN Threat Status
Tetrapleura tetraptera	52	14.42	ritual, spice	tree	
Monodora myristica	52	18.29	ritual, spice, women's health	tree	
Aucoumea klaineana	45	134.10	ritual, skin infections, good luck	tree	VU[1]
Pterocarpus soyauxii	38	9.50	ritual, skin ointment, red kaolin	tree	
Capsicum annuum	38	2.83	childcare, digestive, ritual, women's health, spice	herb	
Annickia affinis	38	25.94	malaria	tree	
Aframomum melegueta	38	0.40	childcare, spice	herb	
Xylopia aethiopica	36	13.62	digestive, ritual, spice	tree	
Massularia acuminata	33	10.07	sprained limbs, ritual, women's health	shrub	
AMT 787	29	0.41	ritual	fungus	
Tabernanthe iboga	29	6.09	ritual	shrub	
Pentaclethra macrophylla	29	17.46	ritual, women's health	tree	
Cymbopogon densiflorus	29	2.18	ritual, mourning	herb	

[1]vulnerable

The majority of the species that we frequently encountered on the market stalls were also sold in the greatest bulk (Table 3). Eighteen species made up almost 50% of the total volume of products available daily on the Gabonese market. *Aucoumea klaineana* was sold in the highest quantity, with an estimated daily available stock of nearly 950 kg. Although the resin of this species represents only 1% of the diversity of plant products sold (Fig 4a), it represents 20% of the daily stock (Fig 4b). Dual purpose species that are used both as food additives and medicine were also well represented in the daily available stock, such as the barks of *Garcinia kola*, seeds of *Monodora myristica*, and the fruits of *Afrostyrax* sp. The seeds of *Irvingia gabonensis* were not included in our market calculations since they were only used as a food additive, but due to their prevalence on the market, we estimated ca. 118 kg to be sold at the main Mont Bouët market in Libreville and ca. 20 kg on the market in Lambaréné.

We calculated the total volume of medicinal plants available for sale on the Gabonese market to be 6807 kg per day (Table 1). Vendors acknowledged discarding stock regularly, yet absolute numbers of discarded plant material were not reported. This material should be recognized as contributing to the entire volume harvested (available stock) but not sold on the market. By dividing the estimated annual value of the medicinal plant trade (US$ 1,538,936) by the average per kilo price (US$ 56), we estimated the annual volume of medicinal plants available on the entire Gabonese market in 2012 to be approximately 27,481 kg.

Table 3 Species representing 50% of total daily volume, extrapolated to the entire Gabonese market.

Species	Part	Traditional uses	Daily market stock (kg)	Habit	IUCN Threat status
Aucoumea klaineana	resin, bark, leaves, wood	ritual, skin infections	948.35	tree	VU[1]
Raphia sp.	palm stalks	ritual	378.40	tree	
Monodora myristica	seed	ritual, women's health	312.70	tree	
Garcinia kola	bark	ritual, palm wine	242.26	tree	VU[1]
Tetrapleura tetraptera	fruit	ritual	224.94	tree	
Ricinodendron heudelotii	seed	medicinal oil, spice	155.92	tree	
Afrostyrax sp. (DQ 1106)	fruit	ritual, spice	155.57	tree	*
Xylopia aethiopica	bark, fruit	digestive, ritual, spice	148.70	tree	
Annickia affinis	bark	malaria	140.65	tree	
Pentaclethra macrophylla	fruit, bark	ritual, women's health	124.59	tree	
Copaifera religiosa	bark	anemia, ritual	121.48	tree	
Daniellia klainei	bark	ritual, sore body	92.85	tree	LR/NT[2]
Garcinia lucida	bark	anti-poison	92.41	tree	
Distemonanthus benthamianus	bark	good luck	76.09	tree	
Croton oligandrus	bark	ritual, women's health	67.78	tree	
Terminalia catappa	oil from seeds	childcare	64.72	tree	
Erythrophleum ivorense	bark	ritual, swollen limbs/feet	62.34	tree	
Massularia acuminata	fruit	ritual, sprained limbs, women's health	59.92	shrub	

[1]Vulnerable; [2] Low risk/Near threatened; *Some species vulnerable

Vulnerable species

Out of the 18 species sold in the highest quantity on the Gabonese marketplace (Table 3), we found two species that were considered vulnerable by the IUCN, *Aucoumea klaineana* and *Garcinia kola*. *A. klaineana* was encountered on nearly half of the market stalls we surveyed. Another possibly vulnerable species was *Afrostyrax* sp. (Table 3), but our plant material was only identified to the genus level and we were unable to confirm whether it was the vulnerable species *Afrostyrax lepidophyllus* Mildbr. *Daniellia klainei* was considered lower risk/near threatened by the IUCN. None of the species encountered most frequently or sold in the highest volume were listed as restricted for international trade by the Convention on Trade in Endangered Species (CITES). Out of the 217 total species encountered at the Gabonese market (Appendix 1), three additional species were listed as vulnerable by the IUCN: *Nauclea diderrichii*, *Brillantaisia lancifolia*, and *Baillonella toxisperma*.

Most salient health issues and traditional uses

Over one-third of the 263 medicinal plant products documented for sale were reported to be used in rituals, which we defined as those plants used in spiritual ceremonies, as good luck charms, as protection against bad spirits or sorcery, and for attracting or keeping a spouse (Fig. 5). The use of

medicinal herbs for good luck baths, such as *Emilia coccinea,* was one of the most common uses of market plants. Women's health ailments comprised 13% of the total number of uses, including plant remedies for vaginal cleanses, fertility, pregnancy, childbirth, postpartum recovery, and increasing breastmilk production. Childcare was the third most common health category of medicinal plants encountered on the market, and included infant health ailments such as diarrhea, cough, and diaper rash, but also local cultural bound concepts such as encouraging children to walk early, closing the fontanels, and treatment of "la rate" (in French), an illness characterized by low body weight and pain on the left side of the body. The category "other" included those health ailments that were only mentioned once or twice by a vendor such as toothache, muscle pain, and jaundice.

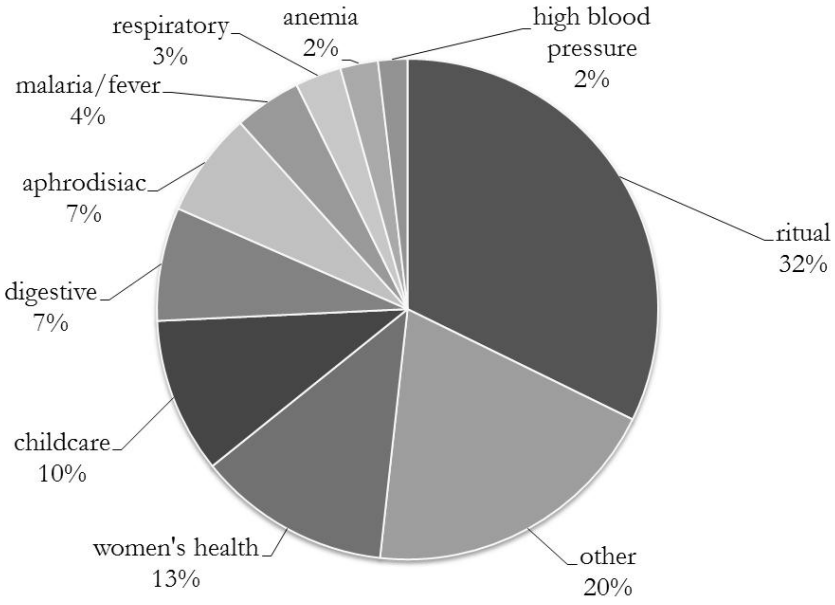


Fig. 5. Most salient health ailments treated by plants sold on the Gabon herbal market in 2012.

Plant vendor concerns

The vendors reported four main obstacles to the domestic medicinal plant trade: high middleman prices, demolishing of medicinal plant markets, negative societal reputation, and loss of collection habitat. Although most of the women from Libreville reported self-collection of medicinal plants, barks were often purchased from a specialized bark harvester. According to the vendors, the selling price of the barks was often lower than their purchase price, resulting in a loss of profit. Secondly, vendors reported that the medicinal herb stalls of Libreville were once joined under one roof, but the former building was demolished, forcing the herbal medicine market to become divided between the La Peyrie and Mont Bouët annex markets (Table 1). The Bwiti medicine sellers in Port-Gentil reported a similar situation in which they were once part of the larger market Marché Grand Village, but have since been moved farther away to a separate market, Marché Bornave. These changes resulted in difficulties securing a fixed place to sell. Several vendors explained that this situation was linked to a tension with some members of the general public against traditional medicine, stigmatizing the vendors in a negative way. Lastly, many of the harvesters we accompanied to collect fresh material reported that the rapid expansion of Libreville has resulted in a loss of habitat to collect medicinal plants, causing further travel in search of material and increased collection costs.

Discussion

Comparison with other African medicinal markets

We calculated Gabon's domestic annual herbal medicine trade to contain 27 tons worth of medicinal plant products with a value of approximately US$ 1.5 million. This volume and economic value was generally smaller than other markets in Africa, including the Eastern Cape Province of South Africa with a total of 525 tons worth US$ 3 million (Dold and Cocks 2002) Ghana with 951 tons worth US$ 7.8 million (van Andel, Myren, and van Onselen 2012), and Benin with 655 tons worth US$ 2.7 million (Quiroz et al. 2014). Gabon's annual herbal trade was more valuable than Sierra Leone, estimated to be worth US$ 64,000 (Jusu and Sanchez 2013).

The average price of herbal medicine in Gabon was $56 per kg, more expensive than in Ghana (US$ 8.2/kg) or Benin (US$ 21/kg), resulting in a fairly high value for a low volume of plant material for sale. The pattern of products sold in low quantities at high prices, such as the most expensive products sold only at Bwiti stalls, has also been documented for markets in South Africa (Williams et al., 2009). The lower value and volume of the Gabonese market could also be attributed to Gabon's relatively low population, 1.6 million, compared to other African countries. The high reported weekly salaries of the herbal vendors may be reflective of Gabon's per capita income, US$19,200 a year, which is four times higher than most sub-Saharan African countries (CIA 2013b). The migrant Beninese vendors reported sales of around US$ 56 a week, which was only slightly higher than the estimated US$ 45 weekly sales reported by market vendors in Benin (Quiroz et al. 2014). The presence of medicinal plants on the market stresses the role of herbal medicine in relatively wealthy African countries with heavily urbanized populations.

The bulk of the daily stock of plant parts in Gabon was sold as bark (30%), followed by resin (20%). In comparison with West African markets, Ghana's daily stock was dominated by fruits and seeds, Benin was mainly leaves and whole plants, and Sierra Leone was mainly barks and leaves. In South Africa (Dold and Cocks 2002), bulbs, tubers and roots represented over 60% of the most frequently traded plant species, where roots represented only 2% of the daily stock in Gabon. In Tanzania, barks and roots were most prevalent on the market (McMillen 2008). Given that 80% of Gabon's surface is covered in forest, the dominance of rainforest barks on the market is not surprising.

Although the rainforest vegetation in Central Africa varies greatly with the savanna-mosaic vegetation of Benin and Ghana, the three countries had some commercialized medicinal plants species in common, such as the seeds and fruits that doubled as food additives and medicine (*Xylopia aethiopica*, *Monodora myristica*, *Aframomum melegueta*). Like the markets in Benin and Ghana, Gabon's most salient health products included those used in ritual and for women's health. Although the volume and value of the herbal material sold in Gabon was much lower than other African markets, the floristic diversity of the market (217 spp.) was higher than in Cameroon (35 spp.)(Betti 2002), Sierra Leone (43 spp.), South Africa (166spp.), and Ghana (209 spp.), and slightly lower than in Benin (283 spp.) and Tanzania (250 ethnospp). Since our market survey captured only six months out of the year and did not include some smaller markets across the country, the total plant diversity of Gabon's markets is likely to be higher than our estimates.

Migrant sellers and imported plants

A notable attribute of the herbal medicinal plant trade in Gabon is the presence of market vendors from neighboring African countries, e.g. Benin, Cameroon, Nigeria, Niger, Togo, who sold medicinal plant products imported into Gabon. From our previous work on Beninese herbal markets (Quiroz et al. 2014), we were able to recognize and identify many Beninese plant products. Previous work on

sub-Saharan African markets has documented the presence of non-African vendors, including Chinese herbal medicine in Tanzania (Hsu 2002) and the sale of Indian herbs in South Africa (Williams, Witkowski, and Balkwill, 2005; Wojtasik, 2013), but also migrants from other African countries, such as Beninese vendors in Ghana (van Andel, Myren, and van Onselen 2012). Since nearly 20% of the Gabonese population is made up of immigrants, and Beninese migrants are the third largest immigrant group (The World Bank 2011) it is possible that Beninese medicinal plant sellers are catering to the demand of Beninese migrants in Gabon. However, the market women that we accompanied in the field mentioned collecting species such as *Cassytha filiformis* specifically for West African immigrants, suggesting that the Gabonese vendors also cater to immigrant healthcare needs. The presence of imported products and vendors at major medicinal plant markets in Gabon may suggest that there is a demand for diverse medicinal products from non-forest vegetation types. The trade of imported herbal medicine has further implications for the sustainability of the national, regional, and continent-wide herbal medicine trade and is an area for future research.

It is likely that Gabonese medicinal plants are exported outside of the country, especially *Tabernanthe iboga* (Neuwinger 1996). The Gabonese branch of the Wildlife Conservation Society in Libreville expressed concern about the unsustainable export-oriented harvest of *T. iboga* (R. Starkey, personal communication July 2012), a concern echoed by the antipoaching canine unit implemented by the Agence Nationale des Parcs Nationaux (ANPN)(Wagtail UK 2013), but no official data on exported species or volumes were available.

Comparison with other Gabonese industries

Although US$ 1.5 million is a substantial value for this informal economy, it is dwarfed by the major natural resource industries of Gabon, namely the US$ 15 billion oil industry (CIA 2013b) and the US$ 1.8 billion timber industry (Forest Legality Alliance 2014). Nevertheless, the income derived from the medicinal plant trade makes substantial contributions to the economic well-being of the plant vendors in Gabon, the majority of whom are women. This pattern has been documented in other countries in Africa (Dold and Cocks, 2002; Jusu and Sanchez, 2013; Quiroz et al., 2014; van Andel et al., 2012; Williams et al., 2009), highlighting the necessity of understanding gender dynamics in the trade of NTFPs (Shackleton and Paumgarten, 2011).

Potential species of concern

Out of the five IUCN red-listed species, only the resin of *Aucoumea klaineana* and bark of *Garcinia kola* were found in high quantities on the market stalls. *A. klaineana* is historically the most popular tree exported from Gabon by the timber industry (Forest Legality Alliance 2014; Global Forest Watch 2000), suggesting that the timber industry has had a large role in the overharvesting of this rainforest tree. In neighboring Cameroon *G. kola* is commonly cultivated, highlighting local responses to managing commercially important resources (Fondoun and Manga 2000). Further investigation is needed to make more substantial claims about the sustainability of these rainforest trees' harvest for medicinal use- including harvesting methods and frequency, natural distribution, population assessments, impact studies and measurements on the rate of extraction versus the rate of natural regeneration (Guinee 2013; Ticktin 2004). Our results can contribute to improved resource management strategies, securing not only the survival of these species, but also the availability of these resources to people who rely on them for their physical, spiritual, and economic well-being (Dold and Cocks 2002). It should also be noted that most of the species that we encountered on the market were not yet assessed by the IUCN, which opens the possibility for additional threatened species.

Salient traditional uses

Plants used in rituals comprised the majority of the medicinal plants sold on the market in Gabon, reflecting the importance of Bwiti practices to modern urban culture in Gabon. Although Bwiti customs are closely associated with the use of *Tabernanthe iboga* (Pope 1969), the indigenous torches represent the greatest volumes of all plant products for sale. *T. iboga* was sold in much smaller volumes, suggesting that the many other ritual plants are commercialized and sold in larger volumes. Women's health issues and childcare comprised the next two largest health domains of commercialized plant products. Medicinal plants are used widely in Gabonese women's healthcare, especially for vaginal cleanses (Towns and van Andel 2014).

Conclusion

This market survey contributes to the literature on the Central African medicinal plant trade, shedding light on the current trade of species in the region, salient health needs and traditional uses met by the market, and the monetary value of this informal economy. With an estimated annual volume of 27 tons of medicinal plant material worth US$ 1.5 million, Gabon's market is smaller than herbal markets in other parts of Africa but generally higher in floristic diversity. Dominated by barks, the Gabon market also offers large quantities of IUCN vulnerable *Aucoumea klaineana* resin for sale. Including this highly valued timber species, only 2% of the 217 species encountered on the market have conservation concerns.

The herbal markets in Libreville housed 75% of the total stock of medicine plant products available for sale daily. The markets in Libreville also featured many migrant vendors, the majority of whom were Beninese, selling imported species not for sale at herbal stalls of Gabonese vendors. Bwiti stalls were concentrated mainly in Port-Gentil while spice stalls selling dual purpose food and medicine products were common throughout the 14 markets we visited. Over 30% of the medicinal plant products from the herbal market were used for ritual purposes, highlighting the role of traditional spiritual practices and ceremonies in urban life in Gabon. Our results serve to fill the gaps in knowledge of a major medicinal market in a conservation-priority country of Central Africa, stress the role of herbal medicine in a relatively wealthy African country, and contribute to the overall understanding of the complexity of the African herbal medicine trade.

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Appendix 1

Plant products recorded for sale on Gabon markets in 2012

Coll. Location	Local name[1]	Plant part	Coll. #	Family	Botanical Name	Use	average weight per sales unit [kg]	price per kg (US$)	IUCN status
Gabon	unknown "twisted liana"	liana			*(any species)*	ceremony	0.382	4.89	
Gabon	bed of gorilla	branch			*(any species)*	ritual	1.000	9.35	
Gabon	bukul (P), nzi (Fa)	fruit with seeds	DQ 1807	Malvaceae	*Abelmoschus moschatus* Medik.	ritual	0.017	275.61	
Gabon	sucre-sucre (Fr)	leaves	AMT 688	Leguminosae	*Abrus precatorius* L.	calm heart, ritual	0.027	65.14	
Gabon	munyenyegi (M)	seed	DQ 1004	Leguminosae	*Abrus precatorius* L.	anti-sorcery, ritual	0.041	24.78	
Benin	boni (F)	fruit	AMT 338	Leguminosae	*Acacia nilotica* (L.) Delile	women's health	0.002	292.94	
Gabon	mangbagabrello (M)	entire plant	AMT 771	Acanthaceae	*Acanthus montanus* (Nees) T.Anderson	childcare	0.157	5.96	
Benin	gbangina (F)	root	AMT 355	Malphigiaceae	*Acridocarpus smeathmanii* (DC.) Guill. & Perr.	anemia	0.285	13.12	
Gabon	mobulo (M)	liana	DQ 1047	Passifloraceae	*Adenia* sp. cf.	ceremony	0.125	14.95	
Gabon	potu (N), l'huile de saison, matimamanga (B)	entire plant	AMT 1021, DQ 1031, DQ 1179	Asteraceae	*Adenostemma viscosum* J.R.Forst. & G.Forst.	childcare, luck, women's health	0.200	9.35	
Gabon	mungunu (Fa)	fruit	AMT 1007, DQ 979	Zingiberaceae	*Aframomum* cf. *alboviolaceum* (Ridl.) K.Schum.	luck, ritual	0.020	46.73	
Gabon	petite piment round, lumbu tsitsi (P)	fruit	AMT 780	Zingiberaceae	*Aframomum melegueta* K.Schum.cf.	childcare, spice	0.006	155.76	
Gabon	noung tistchis (P)	seed	DQ 1808	Zingiberaceae	Aframomum sp.	hemorrhoids	0.041	24.78	
Gabon	nzombe (N), madjombu (P)	leaves	DQ 968	Zingiberaceae	*Aframomum giganteum* (Oliv. & D.Hanb.) K.Schum.	luck, swollen limbs	0.145	12.93	
Gabon	assom (Fa)	stem	DQ 1052	Zingiberaceae	*Aframomum giganteum* (Oliv. & D.Hanb.) K.Schum.	ritual, women's health	0.145	12.17	

Coll. Location	Local name[1]	Plant part	Coll. #	Family	Botanical Name	Use	average weight per sales unit [kg]	price per kg (US$)	IUCN status
Gabon	ditundudimukue (M)	fruit	DQ 997	Zingiberaceae	*Aframomum longipetiolatum* Koechlin	ritual	0.025	63.36	
Benin	atakoun (F)	seed	AMT 309	Zingiberaceae	*Afromomum* sp.	women's health	0.018	57.11	
Gabon	l'ail indigène (Fr)	fruit	DQ 1106	Huaceae	*Afrostyrax* sp.	ritual, spice	0.017	94.92	
Gabon	munyenbi (M)	seed	DQ 1014	Huaceae	*Afrostyrax kamerunensis* G.Perkins & Gilg	ritual	0.041	24.78	
Gabon	mambimatabe (P)	entire plant	AMT 1023	Asteraceae	*Ageratum conyzoides* (L.) L.	childcare	0.299	6.25	
Gabon	aloe	leaves	AMT 784	Asphodeliaceae	*Aloe buettneri* A.Berger	general health	0.068	25.87	
Gabon	mukuka (M)	bark	AMT 667	Apocynaceae	*Alstonia* sp.	malaria, women's health	0.052	17.97	
Gabon	mtsongo (N), mokuka (P)	bark	DQ 964	Apocynaceae	*Alstonia boonei* De Wild.	luck, malaria	0.117	15.98	
Gabon	folo (P)	inflorescence with seeds	DQ 1809	Amaranthaceae	*Amaranthus blitum* L.	tumors	0.041	24.78	
Gabon	odjanmingan nfu (Fa)	entire plant	DQ 1039	Commelinaceae	*Aneilema beniniense* (P.Beauv.) Kunth	ritual	0.105	15.64	
Gabon	onong (Fa), mumbundu (P), mbundu (P)	root	AMT 749, DQ 1111	Anisophylleaceae	*Anisophyllea* sp.	ritual	0.028	50.07	
Gabon	boire jeune, mfo (Fa), la mbamba bengue (Fr)	bark	AMT 743, DQ 963	Annonaceae	*Annickia affinis* (Exell) Versteegh & Sosef	malaria	0.166	1.87	
Benin	atahe (F)	bark	AMT 661	Annonaceae	*Annickia polycarpa* (DC.) Setten & Maas ex I.M.Turner	jaundice	0.073	25.30	
Gabon	muyoha (P)	bark	AMT 1013	Annonaceae	Annona sp.	unknown	0.048	19.47	
Gabon	yinda (P)	bark	AMT 739	Annonaceae	*Anonidium* cf. *mannii* (Oliv.) Engl. & Diels	women's health	0.058	31.84	
Gabon	ayindo (Fa)	bark	AMT 765	Gentianaceae	*Anthocleista* sp.	high blood pressure, diabetes	0.076	24.30	
Gabon	angokon (M), angokon (Fa)	bark	AMT 746, AMT 767	Anacardiaceae	*Antrocaryon klaineanum* Pierre	women's health	0.568	1.65	

Coll. Location	Local name[1]	Plant part	Coll. #	Family	Botanical Name	Use	average weight per sales unit [kg]	price per kg (US$)	IUCN status
Gabon	benzinzao (P), l'arbre de l'éléphant/boire de la estomac (Fr)	bark	AMT 1014, AMT 751	Rubiaceae	*Aoranthe cladantha* (K.Schum.) Somers	aphrodisiac, digestive	0.066	21.24	
Gabon	ibanzao (M)	wood	DQ 990	Rubiaceae	*Aoranthe cladantha* (K.Schum.) Somers	aphrodisiac	0.067	69.31	
Gabon	l'apelle (Fr), rugo (M)	leaves	DQ 1114	Asparagaceae	*Asparagus* cf. *warneckei* (Engl.) Hutch.	ritual	0.100	37.38	
Gabon	okume (P)	bark	AMT 1016	Burseraceae	*Aucoumea klaineana* Pierre	general health	0.111	8.42	VU
Gabon	okume (M)	resin	AMT 1050	Burseraceae	*Aucoumea klaineana* Pierre	ceremony	0.408	4.58	VU
Gabon	torche indigine (small) (Fr)	resin	AMT 750	Burseraceae	*Aucoumea klaineana* Pierre	ritual	0.609	3.07	VU
Gabon	torche indigine (big) (Fr)	resin	AMT 750	Burseraceae	*Aucoumea klaineana* Pierre	ritual	3.292	4.54	VU
Gabon	okume (Fa)	wood	AMT 939	Burseraceae	*Aucoumea klaineana* Pierre	handicapped/ paralyzed	0.059	79.20	VU
Gabon	l'okume (Fr)	leaves	DQ 969	Burseraceae	*Aucoumea klaineana* Pierre	luck, skin infections	0.145	12.93	VU
Gabon	moabi (M), adjab (Fa)	bark	AMT 745, DQ 1009	Sapotaceae	*Baillonella toxisperma* Pierre	aphrodisiac, women's health, ritual	0.077	12.14	VU
Gabon	moabi (M), adjab (Fa)	seed	DQ 1012	Sapotaceae	*Baillonella toxisperma* Pierre	medicinal oil	0.041	24.78	VU
Gabon	moabi (M)	seed		Sapotaceae	*Baillonella toxisperma* Pierre	food for ill	0.200	32.71	VU
Gabon	musinda, porosa, wengui (Eshira Commerial)	wood	DQ 987	Leguminosae	*Bobgunnia fistuloides* (Harms) J.H.Kirkbr. & Wiersema	aphrodisiac	0.067	69.31	
Benin	èponge traditionnel (Fr)	root fiber	DQ 854	Arecaceae	*Borassus aethiopum* Mart.	ceremony	0.138	27.17	
Gabon	dimuenu (P), kri tanguimina (N), tangamina (M, P), nzibilor (Fa), pense tous (Fr), tangemina dibagte (B)	entire plant	AMT 1042, DQ 1033, AMT 1026	Acanthaceae	*Brillantaisia lancifolia* Lindau	anemia, childcare, ritual	0.160	17.52	VU
Gabon	dilemto dikala (M)	leaves	AMT 1038	Acanthaceae	*Brillantaisia* cf. *owariensis* P.Beauv.	flu, heart	0.326	5.73	
Gabon	cola de gorille (Fr)	fruit	AMT 1036	Capparaceae	*Buchholzia coriacea* Engl.	aphrodisiac	0.039	48.55	

Coll. Location	Local name[1]	Plant part	Coll. #	Family	Botanical Name	Use	average weight per sales unit [kg]	price per kg (US$)	IUCN status
Gabon	lembandre (N)	seed	DQ 1000	Capparaceae	*Buchholzia coriacea* Engl.	aphrodisiac, High blood pressure	0.041	24.78	
Gabon	digudimumbu (M)	seed	DQ 1007	Leguminosae	*Caesalpinia bonduc* (L.) Roxb.	women's health	0.010	93.46	
Gabon	mungungu (N), la feuille de l'haricot (Fr)	leaves	DQ 1030	Leguminosae	*Cajanus cajan* (L.) Millsp.	childcare	0.145	12.17	
Gabon	musimina (M)	seed	DQ 998	Leguminosae	*Canavalia ensiformis* (L.) DC.	luck, ritual	0.041	24.78	
Gabon	petite piment, tzoli (M)	fruit	AMT 672, DQ 1002	Solanaceae	*Capsicum annuum* L.	ritual, spice, women's health	0.026	61.90	
Gabon	feuilles de piment (Fr)	entire plant	AMT 684	Solanaceae	*Capsicum annuum* L.	childcare	0.157	5.96	
Gabon	kuta (P)	root		Polygalaceae	*Carpolobia* sp.	aphrodisiac	0.071	26.51	
Gabon	onong (Fa), kara (Fa)	leaves	AMT 1255	Polygalaceae	*Carpolobia alba* G.Don	women's health	0.177	9.93	
Gabon	anong (Fa)	root	AMT 752, AMT 779	Polygalaceae	*Carpolobia alba* G.Don	aphrodisiac	0.071	26.51	
Gabon	kuta (M)	wood	DQ 985	Polygalaceae	*Carpolobia alba* G.Don	aphrodisiac	0.076	61.49	
Gabon	kota (M)	leaves	DQ 1049	Polygalaceae	*Carpolobia lutea* G.Don	aphrodisiac, childcare	0.145	12.17	
Gabon	munziji mangueb (P), la cord de pitier (Fr)	entire plant	DQ 1037	Lauraceae	*Cassytha filiformis* L.	luck, malaria, respiratory	0.105	15.64	
Gabon	mufuma (P), fromagier (Fr)	bark	AMT 1037	Malvaceae	*Ceiba pentandra* (L.) Gaertn.	childcare	0.494	3.78	
Gabon	abam (Fa)	fruit	AMT 1052	Sapotaceae	*Chrysophyllum lacourtianum* De Wild.	digestive	0.378	4.26	
Gabon	colatier (Fr), mbonatzu (P)	bark	AMT 1015	Malvaceae	*Cola acuminata* (P.Beauv.) Schott & Endl.	women's health	0.046	20.32	
Gabon	cola de gorille (Fr), yiel (M)	fruit	DQ 1010	Malvaceae	*Cola acuminata* (P.Beauv.) Schott & Endl.	birth facilitation, cermony	0.090	17.88	
Gabon	abe (Fa	bark	AMT 664	Malvaceae	*Cola* sp. cf.	women's health	0.062	15.07	
Gabon	unknown	leaves	AMT 1020	Combretaceae	*Combretum* sp.	luck	0.183	10.21	

Coll. Location	Local name[1]	Plant part	Coll. #	Family	Botanical Name	Use	average weight per sales unit [kg]	price per kg (US$)	IUCN status
Gabon	mutombi (Maongo), lendem (N), motombi (P)	bark	AMT 755, DQ 956	Leguminosae	*Copaifera religiosa* J.Leonard	anemia, luck	0.247	7.58	
Gabon	anzem	root		Leguminosae	*Copaifera* cf. *religiosa* J.Leonard	anti-worms	0.077	121.54	
Gabon	unknown	leaves		Costaceae	*Costus* cf. *afer* Ker Gawl.	ritual	0.177	9.93	
Gabon	unknown	inflorescence		Costaceae	*Costus* cf. *afer* Ker Gawl.	ritual	0.500	3.74	
Gabon	canne sauvage	stem		Costaceae	*Costus* sp.	ceremony	0.177	9.93	
Gabon	canne sauvage (Fr), mikuis (N)	leaves, stem	AMT 693, DQ 1029	Costaceae	*Costus lucanusianus* J.Braun & K.Schum.	luck	0.177	9.93	
Gabon	feuilles obamba (N)	leaves	AMT 692	Costaceae	*Costus maboumiensis* Pellegr.	luck	0.177	9.93	
Gabon	mikwisa benga (M), okossa mbumba (Om)	entire plant	DQ 1079	Costaceae	*Costus phyllocephalus* K.Schum.	ritual	0.157	11.92	
Gabon	ewome-ele (Fa)	bark	AMT 741	Olacaceae	*Coula edulis* Baill.	digestive	0.058	31.84	
Gabon	ewome-ele (Fa), kme (Fa)	fruit	AMT 742, DQ 982	Olacaceae	*Coula edulis* Baill.	ritual	0.017	55.12	
Gabon	nyundubalosi (M), onion de sorcier (Fr)	entire plant	AMT 799	Amarylliadaceae	*Crinum* sp.	ritual	0.161	23.22	
Gabon	mokek (N)	bark	AMT 677	Euphorbiaceae	*Croton* sp.	childcare	0.098	19.07	
Gabon	mbamba (N), misembe (Fa)	bark	DQ 965	Euphorbiaceae	*Croton* sp.	luck	0.179	10.47	
Gabon	mizembe (Fa)	bark	DQ 981	Euphorbiaceae	*Croton* sp.	ritual, women's health	0.116	15.92	
Gabon	mubanga (M), le bois de jemeaux (Fr)	bark	DQ 1050	Euphorbiaceae	*Croton* sp.	childcare, ritual	0.134	6.97	

Coll. Location	Local name[1]	Plant part	Coll. #	Family	Botanical Name	Use	average weight per sales unit [kg]	price per kg (US$)	IUCN status
Gabon	misembe (Fa), oyop (Fa), ongen (Fa)	bark	AMT 666, AMT 941	Euphorbiaceae	*Croton oligandrus* Pierre ex Hutch.	ritual, women's health	0.202	27.80	
Gabon	unknown	seed	DQ 1008	Euphorbiaceae	*Croton tiglium* L.	digestive	0.150	6.85	
Gabon	ingone (Fa)	seed	AMT 798	Cucurbitaceae	*Cucumeropsis mannii* Naudin	multiple	0.056	10.01	
Gabon	bater (M)	seed	DQ 1013	Cucurbitaceae	*Cucurbita* sp.	childcare, women's health	0.041	24.78	
Gabon	mdum (P, N)	bark	DQ 960	Leguminosae	*Cylicodiscus gabunensis* Harms	luck	0.221	8.46	
Benin	tisane (Fr)	leaves	DQ 318	Poaceae	*Cymbopogon citratus* (DC.) Stapf	digestive	0.300	1.25	
Gabon	izazango/nitsatsagu (P)	inflorescence	DQ 1036	Poaceae	*Cymbopogon densiflorus* (Steud.) Stapf	ceremony, mourning, ritual	0.042	44.50	
Gabon	sasao (M)	entire plant	AMT 788	Cyperaceae	*Cyperus articulatus* L.	ritual, women's health	0.066	28.32	
Gabon	batsasu (M)	rhizome	AMT 790, DQ 1051	Cyperaceae	*Cyperus articulatus* L.	ceremony, ritual	0.005	350.47	
Gabon	paungu (P), mutanghani (M)	bark	AMT 1029, AMT 757	Leguminosae	*Daniellia klainei* A.Chev.	luck, sore body	0.225	6.24	LR/NT
Gabon	mipipingi (P), le faux arachide qu'on ne mange pas (Fr)	entire plant	DQ 1027	Leguminosae	*Desmodium adscendens* (Sw.) DC.	women's health	0.105	15.64	
Gabon	enouk (Fa)	bark	AMT 785	Leguminosae	*Detarium macrocarpum* Harms	ritual	0.025	74.87	
Gabon	padouk (Fa)	bark	AMT 946	Leguminosae	*Dialium* cf. *guineense* Willd.	anemia	0.205	22.79	
Gabon	lemasses (B)	entire plant	DQ 1120	Melastomataceae	*Dinophora spenneroides* Benth.	increase appetitie, anemia	0.209	7.83	
Gabon	mgongula (P), ngugulansali (P), torgniungui (M), mussimene (M)	seed	DQ 1006, DQ 996	Leguminosae	*Dioclea* cf. *reflexa* Hook.f.	ritual	0.006	155.76	

Coll. Location	Local name[1]	Plant part	Coll. #	Family	Botanical Name	Use	average weight per sales unit [kg]	price per kg (US$)	IUCN status
Gabon	ngogolo (M), le mille pats de la rivière (Fr)	seed	DQ 1042	Leguminosae	*Dioclea hexandra* (Ralph) Mabb.	muscle pain	0.006	155.76	
Gabon	mbanda (P)	tuber (aerial)	AMT 769	Dioscoreaceae	*Dioscorea* sp.	aphrodisiac	0.043	36.21	
Gabon	nyam de diable (Fr)	tuber	AMT 770	Dioscoreaceae	*Dioscorea* sp.	women's health	0.069	13.64	
Gabon	L'igname sauvage (Fr), Lindi (N)	tuber (aerial)	DQ 975	Dioscoreaceae	*Dioscorea bulbifera* L.	ritual	0.043	21.73	
Gabon	muvengi (M), mbongi (N), eiyeni (Fa)	bark	AMT 756, DQ 961	Leguminosae	*Distemonanthus benthamianus* Baill.	luck	0.158	8.87	
Gabon	petite racine rouge, milundulu, demarreur rouge, bundu (N)	root	AMT 754, DQ 1062	Moraceae	*Dorstenia psilurus* Welw.	aphrodisiac	0.019	75.78	
Gabon	muyunguo (M)	bark	DQ 1061	Euphorbiaceae	*Drypetes gossweileri* S.Moore	protection against snakes	0.765	2.44	
Gabon	aka (Fa)	fruit	DQ 978	Malvaceae	*Duboscia macrocarpa* Bocq.	ceremony	0.012	134.11	
Gabon	lipital (N)	entire plant	DQ 1068	Amaranthaceae	*Dysphania ambrosioides* (L.) Mosyakin & Clemants	digestive, sprained joints	0.068	13.74	
Gabon	muwidich (N), santan (Fa)	entire plant	AMT 680, DQ 1064	Asteraceae	*Eclipta prostrata* (L.) L.	childcare, ritual	0.157	10.43	
Gabon	ngazti (P), pulpe d' palm (Fr), drafu (M)	fruit kernel	AMT 1031	Arecaceae	*Elaeis guineensis* Jacq.	medicinal oil	0.006	93.46	
Gabon	la tirance (Fr), mkoub (P)	entire plant	AMT 687, DQ 971	Acanthaceae	*Elytraria marginata* Vahl	ritual	0.157	8.94	
Gabon	feuilles de brousse/ l'oreille du chien (Fr), mibeles (N), alomyu (Fa)	entire plant	AMT 695, DQ 970	Asteraceae	*Emilia coccinea* (Sims) G.Don	luck, HBP	0.253	7.39	
Benin	gbagbada (F)	seed	DQ 412	Leguminosae	*Entada gigas* (L.) Fawc. & Rendle	ceremony	0.030	34.27	
Gabon	mbaka (P), boire de lune (Fr), mkas (N)	bark	AMT 1010, DQ 959	Leguminosae	*Erythrophleum ivorense* A.Chev.	foot soother, swollen limbs, luck	0.242	5.79	

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Benin	gbokoka (F)	rope	DQ 689	Moraceae	*Ficus thonningii* Blume	ritual	0.200	9.35	
Gabon	tobu (M), Tobu (P), mbudi (N)	bark	AMT 747, DQ 955	Rubiaceae	*Fleroya ledermannii* (K.Krause) Y.F.Deng	digestive, luck, women's health	0.074	18.94	
Gabon	esok, onyeng (Fa), bois amere (Fr)	bark	AMT 777	Clusiaceae	*Garcinia kola* Heckel	palm wine	0.134	13.91	VU
Gabon	mukoka (M)	wood	DQ 992	Clusiaceae	*Garcinia kola* Heckel	aphrodisiac	0.067	69.31	VU
Gabon	esop (Fa)	bark	AMT 786	Clusiaceae	*Garcinia lucida* Vesque	anti-poison	0.127	29.45	
Gabon	matchumangui (N), le coeur de cuchon (Fr)	entire plant	DQ 1056	Rubiaceae	*Geophila afzelii* Hiern	digestive, ritual	0.105	15.64	
Gabon	duba (B)	entire plant	DQ 1020	Rubiaceae	*Geophila* sp.	ritual, women's health	0.105	15.64	
Gabon	inuka (M)	entire plant	AMT 1049	Asteraceae	*Gnaphalium* sp.	anti-poison	0.070	13.35	
Gabon	feuilles de coton (Fr)	entire plant	AMT 681	Malvaceae	*Gossypium barbadense* L.	childcare	0.157	10.43	
Gabon	unknown	seed		Malvaceae	*Gossypium* cf. *barbadense* L.	women's health	0.041	24.78	
Gabon	otunga (Fa)	root	AMT 942	Annonaceae	*Greenwayodendron* cf. *suaveolens* (Engl. & Diels) Verdc.	women's health	0.026	215.67	
Gabon	kevasingo (Fa), obaka (M)	bark	AMT 764, AMT 668	Leguminosae	*Guibourtia tessmannii* (Harms) J.Leonard	high blood pressure, diabetes, aphrodisiac, luck, women's health	0.191	4.90	
Gabon	musasa (N)	leaves	AMT 685	Clusiaceae	*Harungana madagascariensis* Lam. ex Poir.	women's health	0.177	5.28	
Gabon	atuin (Fa)	bark	AMT 778	Hypericaceae	*Harungana madagascariensis* Lam. ex Poir.	childcare	0.139	13.29	
Gabon	madulegele/rumuenu (P), biringele (B), le mirroir (Fr)	leaves	AMT 1024, DQ 1121	Rubiaceae	*Heinsia crinita* (Afzel.) G.Taylor	luck	0.306	6.11	
Gabon	djelewende (Om)	entire plant	DQ 967	Rubiaceae	*Heinsia* sp.	luck	0.105	17.88	
Gabon	kulu (B)	leaves	DQ 1119	Malvaceae	*Hibiscus surattensis* L.	anemia	0.356	4.94	

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Gabon	chocolatier (Fr), odika (P), muebe (P)	bark	AMT 1017	Irivinginaceae	*Irvingia gabonensis* (Aubry-Lecomte ex O'Rorke) Baill.	digestive	0.087	10.74	LR/NT
Gabon	leleoh (N), madjudjuga (P)	entire plant	AMT 679, DQ 1035	Crassulaceae	*Kalanchoe crenata* (Andrews) Haw.	respiratory	0.157	11.92	
Gabon	rata (N, Fa)	bark	AMT 690, AMT 766	Rubiaceae	*Keetia* sp.[3]	women's health	0.058	31.84	
Gabon	mulunda (P), le fruit que l'elefant avale (Fr)	fruit	DQ 1038	Cucurbitaceae	*Lagenaria breviflora* (Benth.) Roberty	childcare, ritual	0.136	6.87	
Benin	ado (F)	fruit	DQ 396	Cucurbitaceae	*Lagenaria siceraria* (Molina) Standl.	ritual	0.017	94.92	
Benin	hounmansi (F)	bark	DQ 408	Anacardiaceae	*Lannea barteri* (Oliv.) Engl.	malaria, anemia	0.166	11.12	
Gabon	letchok (N)	bark	DQ 962	Anacardiaceae	*Lannea welwitschii* (Hiern) Engl	luck, women's health	0.184	10.16	
Gabon	feuilles de brousse (Fr), mundji (P), munju (N)	leaves	AMT 696, DQ 1028	Icacinaceae	*Lasianthera africana* P.Beauv.	luck	0.180	10.38	
Gabon	murlona (N)	fruit	DQ 1046	Icacinaceae	*Lavigeria* sp.	general health	0.102	15.86	
Gabon	l'appele (Fr)	entire plant	AMT 1040	Asparagaceae	*Ledebouria camerooniana* (Baker) Speta	ritual	0.009	207.68	
Gabon	mbala, lalilmiu (P)	leaves	AMT 1003, DQ 1025	Vitaceae	*Leea guineensis* G. Don	luck	0.186	5.02	
Gabon	ntitsjantsitsikumbu (P), gombalonga (N), djanzukun (P), afing (Fa), gumbalunga (P)	entire plant	AMT 671, DQ 973, AMT 760	Verbenaceae	*Lippia rugosa* A.Chev.	luck, women's health	0.174	10.74	
Gabon	insaha la muele (B)	leaves	DQ 1024	Euphorbiaceae	*Macaranga monandra* Müll.Arg.	ritual	0.145	12.17	
Gabon	melange (Fr)	bottle			many species	ceremony	0.200	18.69	
Gabon	inja la muele (B)	leaves	AMT 1044, DQ 1022	Euphorbiaceae	*Maprounea membranacea* Pax & K.Hoffm.	ritual	0.190	9.26	

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Gabon	namey (P), muendi (N), morendoc (N)	fruit	AMT 1005, DQ 1001	Rubiaceae	*Massularia acuminata* (G.Don) Bullock ex Hoyle	ritual, sprained limbs, women's health	0.073	25.60	
Gabon	depeyrie (M)	bark	AMT 748	Annonaceae	*Meiocarpidium lepidotum* (Oliv.) Engl. & Diels	childcare	0.023	40.63	
Gabon	ovandava (P)	leaves	AMT 1018	Pandaceae	*Microdesmis* cf. *puberula* Hook.f. ex Planch.	general health	0.134	13.95	
Gabon	pongogo (P)	entire plant	DQ 1258	Asteraceae	*Mikania chenopodifolia* Willd.	women's health	0.300	5.45	
Gabon	mabumbolu (P), mtsutsulu (N)	entire plant	AMT 678, DQ 972	Cucurbitaceae	*Momordica charantia* L.	childcare, high blood pressure, malaria, diabetes, luck	0.177	10.56	
Gabon	aboubou, bater bama bulu (M)	seed	DQ 1005	Cucurbitaceae	*Momordica charantia* L.	malaria, typhoid fever, women's health, yellow fever	0.100	10.28	
Gabon	nzin (Fa), nzingu (M)	seed	DQ 977, DQ 1043	Annonaceae	*Monodora myristica* (Gaertn.) Dunal	luck, ritual, spice, women's health	0.100	9.35	
Gabon	fep (Fa)	bark	DQ 980	Annonaceae	*Monodora myristica* (Gaertn.) Dunal	ritual	0.183	10.19	
Gabon	mwenda (P)	root	AMT 1011	Loganiaceae	*Mostuea hirsuta* (T.Anderson ex Benth.) Baill.	aphrodisiac	0.024	77.88	
Benin	ahohoroma (F)	root	DQ 428	Rubiaceae	*Mostuea hirsuta* (T.Anderson ex Benth.) Baill.	ceremony	0.100	37.38	
Gabon	museynga (M)	entire plant	AMT 1045	Urticaceae	*Musanga cecropioides* R.Br. ex Tedlie	internal sores	0.213	4.39	
Gabon	musinga (M)	bark	AMT 1309	Urticaceae	*Musanga* cf. *cecropioides* R.Br. ex Tedlie	respiratory, toothaches	0.240	7.70	
Gabon	afuluem (Fa)	leaves	DQ 1099	Rubiaceae	*Mussaenda* sp.	ritual	0.177	9.93	
Gabon	afulem (Fa)	entire plant	AMT 1034	Moraceae	*Myrianthus* sp.	luck	0.020	46.73	
Gabon	afunlum (Fa)	leaves	AMT 762	Moraceae	*Myrianthus serratus* (Trécul) Benth.	luck	0.177	9.93	
Gabon	mbilinga (M)	bark	AMT 901	Rubiaceae	*Nauclea diderrichii* (De Wild.) Merr.	aphrodisiac	0.127	14.55	VU
Gabon	mbilinga (M)	wood	DQ 986	Rubiaceae	*Nauclea diderrichii* (De Wild.) Merr.	aphrodisiac	0.013	359.45	VU

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Gabon	mopintiti (P), onvup-ele (Fa)	bark	AMT 1009, AMT 740	Bignoniaceae	*Newbouldia laevis* (P.Beauv.) Seem.	respiratory	0.119	15.71	
Gabon	hyssop (Fr)	leaves	AMT 1187	Bignoniaceae	*Newbouldia laevis* (P.Beauv.) Seem.	ritual	0.177	9.93	
Benin	tabac (Fr)	leaves	DQ 379	Solanaceae	*Nicotiana tabacum* L.	luck	0.181	9.72	
Gabon	nzianzi (P), OsingFa (Fa), ocim (P, Fa), nsiansi sigeh (P)	entire plant	AMT 789, DQ 1041, DQ 1113	Lamiaceae	*Ocimum americanum* L.	luck, respiratory, ritual, women's health	0.044	42.97	
Gabon	nsiansi zineyhey (Puna), ntzianzi (P), madumbaduma (N)	entire plant	AMT 669, AMT 772	Lamiaceae	*Ocimum gratissimum* L.	childcare, malaria, women's health	0.157	5.96	
Gabon	racine du Cameroun (Fr)	root	AMT 782	Araliaceae	*Panax* sp.	aphrodisiac	0.016	59.34	
Gabon	mubogo (P	bark	AMT 1012	Pandaceae	*Panda oleosa* Pierre	women's health	0.047	19.88	
Gabon	ando (Fa)	seed	DQ 984	Pandaceae	*Panda oleosa* Pierre	ritual	0.041	24.78	
Gabon	lufumbu (P)	leaves	AMT 1027	Pandanaceae	*Pandanus* sp.	sores	0.032	116.82	
Gabon	unknown	stem		Passifloraceae	*Passiflora quadrangularis* L.	unknown	1.000	1.76	
Gabon	cinq feuilles (Fr)	leaves	AMT 1022	Sapindaceae	*Paullinia pinnata* L.	luck	0.130	14.38	
Gabon	mupanzi (M), inhansa (B)	leaves	AMT 1046, DQ 1023	Leguminosae	*Pentaclethra macrophylla* Benth.	luck, ritual	0.072	12.98	
Gabon	ebeig (Fa), mupanji (N), mankenun (P)	bark	AMT 663, DQ 995	Leguminosae	*Pentaclethra macrophylla* Benth.	ritual, women's health	0.112	8.34	
Gabon	mupanji (N), mankenun (P)	fruit	DQ 993	Leguminosae	*Pentaclethra macrophylla* Benth.	ritual	0.102	9.21	
Gabon	mupanji (N), mankenun (P), movanti (P)	seed	DQ 994	Leguminosae	*Pentaclethra macrophylla* Benth.	ritual	0.041	24.78	

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Gabon	ngovi (P), njovi polu (P)	entire plant	AMT 1019, AMT 697	Apocynaceae	*Periploca nigrescens* Afzel	luck	0.098	19.07	
Gabon	abian (Fa), arbre de genie (Fr)	bark	DQ 1018	Lecythidaceae	*Petersianthus macrocarpus* (P.Beauv.) Liben	women's health	0.127	14.54	
Gabon	dighoundou (M)	fruit	DQ 1117	Apocynaceae	*Picralima nitida* (Stapf) T.Durand & H.Durand	typhoid fever	1.794	3.13	
Gabon	dighoundou (M), duhundu (P), ebame (Fa)	bark	DQ 1118, AMT 689	Apocynaceae	*Picralima nitida* (Stapf) T.Durand & H.Durand	diabetes, high blood pressure, malaria	0.046	41.08	
Benin	injaiye (T)	seed	AMT 658	Piperaceae	*Piper guineense* Schumach. & Thonn.	women's health	0.001	10.43	
Gabon	fouketou (P)	liana	AMT 791	Piperaceae	*Piper guineense* Schumach. & Thonn.	respiratory	0.382	4.89	
Gabon	abonza (Fa), malemto (N)	entire plant	AMT 761, DQ 1032	Piperaceae	*Piper umbellatum* L.	ceremony, hemorrhoids	0.157	10.43	
Gabon	ntoum/debema (Fa)	bark	AMT 904	Leguminosae	*Piptadeniastrum africanum* (Hook.f.) Brenan	women's health	0.127	14.55	
Gabon	humbu (M)	entire plant	DQ 1065	Araceae	*Pistia stratiotes* L.	internal sores	0.024	78.98	
Gabon	feuilles de brousse (Fr)	entire plant	AMT 691	Pteridaceae	*Pityrogramma calomelanos* (L.) Link	luck	0.157	10.43	
Gabon	isula (Fa)	bark	DQ 958	Euphorbiaceae	*Plagiostyles africana* (Müll.Arg.) Prain	childcare, luck	0.180	10.38	
Gabon	intabi (B)	entire plant	DQ 1021	Lamiaceae	*Plectranthus occidentalis* B.J.Pollard	ritual	0.105	15.64	
Gabon	aye (Fa)	fruit	DQ 983	Anisophylleaceae	*Poga oleosa* Pierre	childcare, epilepsy	0.102	15.86	
Gabon	ouamanta (M)	entire plant	DQ 1044	Portulaceae	*Portulaca quadrifida* L.	ritual	0.105	15.64	
Benin	kakey (F)	wood	AMT 208	Leguminosae	*Prosopis africana* (Guill. & Perr.) Taub.	childcare	0.132	35.40	
Gabon	mazunaunbali (Puna)	bark	AMT 738	Anacardiaceae	*Pseudospondias* cf. *longifolia* Engl.	anemia, women's health	0.092	10.16	
Gabon	guave (Fr)	leaves	AMT 1270	Myrtaceae	*Psidium guajava* L.	digestive	0.177	9.93	
Gabon	coller-coller (Fr)	leaves	AMT 1039, AMT 686	Rubiaceae	*Psydrax palma* (K.Schum.) Bridson	ritual	0.131	10.70	

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Benin	kuli-kuli goto (F)	bark	AMT 74, DQ 415	Combretaceae	*Pteleopsis suberosa* Engl. & Diels	childcare	0.273	6.78	
Gabon	kaolin rouge (Fr), inzingue (M)	wood	AMT 781, DQ 1017	Leguminosae	*Pterocarpus soyauxii* Taub.	ritual	0.091	51.63	
Gabon	issoumbu	bark	DQ 966, AMT 792	Myristicaceae	*Pycnanthus angolensis* (Welw.) Warb.	respiratory, luck	0.185	10.10	
Gabon	bohubobang (M)	fungus	AMT 676	Polyporaceae	*Pycnoporus sanguineus* (L.) Murrill	childcare	0.005	186.92	
Gabon	issindigal (P)	wood	DQ 989	Simaroubaceae	*Quassia africana* (Baill.) Baill.	aphrodisiac, women's health	0.067	69.31	
Gabon	zinderal, sindu gala	root	AMT 763	Simaroubaceae	*Quassia* cf. *africana* (Baill.) Baill.	high blood pressure	0.028	133.51	
Gabon	ngangji (Fa)	seed	DQ 976	Arecaceae	*Raphia* sp.	ritual	0.017	54.98	
Gabon	flambout (Fr)	palm stalks		Arecaceae	*Raphia* sp.	ceremony	1.000	1.87	
Benin	dekwin (F)	seed	DQ 253	Arecaceae	*Raphia hookeri* G.Mann & H.Wendl.	childcare	0.016	65.07	
Gabon	nzezan (Fa)	seed	DQ 1105	Euphorbiaceae	*Ricinodendron heudelotii* (Baill.) Heckel	medicinal oil, spice	0.041	24.78	
Benin	fefekuba (T)	seed	DQ 564	Euphorbiaceae	*Ricinus communis* L.	fever	0.041	24.78	
Gabon	akoha (Fa), igamu (P)	root	AMT 665	Violaceae	*Rinorea* sp. cf.[2]	digestive, women's health	0.100	37.38	
Benin	kudo (F)	root	AMT 25	Rubiaceae	*Sarcocephalus latifolius* (Sm.) E.A.Bruce	women's health	0.063	59.81	
Gabon	kenkisi (P)	entire plant	AMT 1030	Cyperaceae	*Scleria boivinii* Steud.	heart pain	0.044	42.48	
Gabon	orandara (Puna), maduey duey (P), ugandala (N)	entire plant	AMT 699, AMT 674	Scrophulariaceae	*Scoparia dulcis* L.	luck, respiratory	0.134	12.21	
Gabon	l'ail indigine pour le riz (Fr), munyenbi (M), essun (Fa)	bark	DQ 1107, DQ 1019	Leguminosae	*Scorodophloeus zenkeri* Harms[2]	ritual, spice	0.023	20.62	

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Gabon	njovi yango (P)	entire plant	AMT 698	Apocynaceae	*Secamone afzelii* (Roem. & Schult.) K.Schum.	luck	0.157	10.43	
Gabon	ahroyhroy (Om), meroilli (P, Fr), magoyiu (M)	entire plant	AMT 683, DQ 1016	Selaginellaceae	*Selaginella myosurus* Alston	ceremony, luck, women's health	0.157	5.96	
Gabon	itsiamuna amba (P)	entire plant	AMT 675	Leguminosae	*Senna alata* (L.) Roxb.	typhoid fever	0.017	109.95	
Gabon	bakanbit (M)	entire plant	DQ 1115	Malvaceae	*Sida acuta* Burm.f.	women's health	0.187	10.02	
Gabon	unknown	fruit		Solanaceae	*Solanum* sp.	unknown	0.285	5.64	
Gabon	mukier (M)	fruit	DQ 1116	Solanaceae	*Solanum* cf. *macrocarpon* L.	childcare	0.040	4.67	
Gabon	mineka (P)	fruit	AMT 673	Solanaceae	*Solanum anguivi* Lam.	women's health	0.017	55.12	
Gabon	bambo lungo (M), l'aubergine sauvage (Fr)	fruit	DQ 1067	Solanaceae	*Solanum* cf. *anguivi* Lam.	ceremony	0.017	55.14	
Benin	akaono (T)	leaves	AMT 247	Poaceae	*Sorghum bicolor* (L.) Moench	anemia	0.083	21.19	
Gabon	amban (Fa)	entire plant	AMT 1035	Araceae	sp.	ritual	0.003	311.53	
Gabon	odjanmingan ovoel (Fa)	entire plant	DQ 1040	Acanthaceae	sp.	ritual	0.105	15.64	
Gabon	njumu (P)	fruit	AMT 1028	Humiriaceae	sp. cf.	heart pain	0.009	207.68	
Gabon	feuilles de poison (Fr)	entire plant	AMT 1043	Rubiaceae	*Spermacoce* sp.	anti-poison	0.185	5.05	
Gabon	bongi (P)	inflorescence with seeds	AMT 1355	Poaceae	*Streptogyna crinita* P.Beauv	ritual	0.001	1869.16	
Gabon	dirembi (P)	fruit	DQ 1110	Loganiaceae	*Strychnos aculeata* Soler.	fish poison, ritual	0.102	15.86	
Gabon	dirembi (P)	fruit	DQ 1109	Loganiaceae	*Strychnos icaja* Baill.	fish poison, ritual	0.102	15.86	
Gabon	demarreur noir (Fr)	root	AMT 783, AMT 753	Menispermiaceae	*Synclisia scabrida* Miers	aphrodisiac	0.019	48.34	
Gabon	graines de bois sacree (Fr)	fruit	AMT 1048	Apocynaceae	*Tabernanthe iboga* Baill.	ceremony	0.003	311.53	
Gabon	iboga (Fr, Fa, N)	root	DQ 974	Apocynaceae	*Tabernanthe iboga* Baill.	ceremony	0.151	61.89	

Coll. Location	Local name[1]	Plant part	Coll. #	Family	Botanical Name	Use	average weight per sales unit [kg]	price per kg (US$)	IUCN status
Gabon	bois sacree (Fr)	bottle (small)		Apocynaceae	*Tabernanthe iboga* Baill.	ceremony	0.200	46.73	
Gabon	bois sacree (Fr)	bottle (large)		Apocynaceae	*Tabernanthe iboga* Baill.	ceremony	0.850	21.99	
Gabon	mbraha (N), muburg (M)	entire plant	AMT 694, DQ 1015	Leguminosae	*Tephrosia vogelii* Hook.f.	fish poison, luck	0.039	42.48	
Gabon	tsamu (M)	fruit	DQ 1123	Leguminosae	*Tephrosia vogelii* Hook.f.	luck, fish posion	0.014	133.51	
Gabon	huile d'almond (Fr)	bottle		Combretaceae	*Terminalia catappa* L.	childcare	0.200	32.71	
Gabon	ya ramponu (N)	fruit	DQ 954	Leguminosae	*Tetrapleura tetraptera* (Schum. & Thonn.) Taub.	luck, spice	0.044	8.50	
Gabon	tsele (N)	bark	DQ 957	Leguminosae	*Tetrapleura tetraptera* (Schum. & Thonn.) Taub.	luck	0.251	7.45	
Gabon	unknown	leaves	AMT 1025	Thomandersiaceae	*Thomandersia* sp.	fish poison, luck	0.107	17.47	
Gabon	mubindisa (M)	entire plant	DQ 1066	Commelinaceae	*Tradescantia zebrina* Bosse	burns	0.222	8.42	
Gabon	mboa (P)	fungus	AMT 1006		unidentified	ceremony	0.003	311.53	
Gabon	mbanda (P)	fruit	AMT 1008		unidentified	aphrodisiac	0.149	12.54	
Gabon	kiliguu (M)	fruit	AMT 1041		unidentified	women's health	0.003	747.66	
Gabon	seviki (M)	bark	AMT 1047		unidentified	ritual	0.213	8.78	
Gabon	kilinga (P)	tuber	AMT 1353		unidentified	ceremony	0.006	311.53	
Gabon	kandrina (P)	seed	AMT 1354		unidentified	ceremony	0.003	623.05	
Gabon	abunku (Fa)	fungus	AMT 787		unidentified	ceremony	0.007	133.51	
Gabon	mabaman (Fa)	bark	AMT 940		unidentified	multiple	0.143	65.36	
Gabon	lukanga (P)	wood	DQ 988		unidentified	aphrodisiac	0.034	137.44	
Gabon	digundu (M)	fruit	DQ 1011		unidentified	typhoid fever	0.102	15.86	
Gabon	nimu (M)	fruit	DQ 1048		unidentified	childcare	0.102	15.86	
Gabon	esok (Fa)	root	DQ 1063		unidentified	poison antidote	0.093	20.10	
Gabon	lit de jumeaux (Fr)	bark			unidentified	aphrodisiac	0.127	14.55	

Coll. Location	Local name[1]	Plant part	Coll. #	Family	Botanical Name	Use	average weight per sales unit [kg]	price per kg (US$)	IUCN status
Gabon	setembwand	root			unidentified	aphrodisiac	0.077	48.62	
Gabon	milangi (P), langue de peroquet (Fr)	leaves			unidentified	women's health	0.145	6.47	
Gabon	kandila (M)	fungus			unidentified	ritual	0.005	186.92	
Gabon	unknown	bottle (large)			unidentified mixture	childcare	1.500	12.46	
Gabon	unknown	root			unidentified- very large root, yellowish inside	unknown	0.077	48.62	
Gabon	mongongo (N)	entire plant	DQ 1034	Orchidaceae	*Vanilla sp.*	childcare	0.105	15.64	
Gabon	bikambilar (Fa)	entire plant	AMT 807	Asteraceae	*Vernonia amygdalina* Delile	digestive	0.157	10.43	
Gabon	milumnemugan (P), kala (M)	fruit	DQ 1003	Annonaceae	*Xylopia aethiopica* (Dunal) A.Rich.	digestive, ritual, spice	0.048	33.53	
Gabon	torche indigine (small) (Fr)	bark	AMT 750	Annonaceae	*Xylopia aethiopica* (Dunal) A.Rich.	ritual	0.057	32.40	
Gabon	torche indigine (big) (Fr)	bark	AMT 750	Annonaceae	*Xylopia aethiopica* (Dunal) A.Rich.	ritual	0.308	32.40	
Gabon	olong (Fa)	bark	AMT 1033	Rutaceae	*Zanthoxylum* cf. *heitzii* (Aubrév. & Pellegr.) P.G.Waterman	sexually transmitted infections	0.262	7.13	
Gabon	graine mais (Fr)	seed		Poaceae	*Zea mays L.*	aphrodisiac	0.041	24.78	
Gabon	gingembre (Fr)	rhizome		Zingiberaceae	*Zingiber officinale* Roscoe	digestive	0.113	12.41	

[1]Language abbreviations are as follows: B (Bateke), F (Fon), Fa (Fang), Fr (French), P (Bapounou), M (Mitsogho), N (Nzebi), Om (Omiene), T (Tcha)
[2]Identified by wood anatomist
[3]Identified by DNA barcoding

Appendix 2

Weight of plant species recorded for sale in Gabon in 2012 per market stall

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Type of stall	Herb	Spice	Togo Spice	Spice	Spice	Herb	Herb	Herb	Herb	Herb	Herb	Herb	Cameroon Spice	Ambulant	Benin Herb	Nigeria Bwiti	Herb	Spice	Herb	Spice	Bwiti
	Location	Mont Bouët	Nkembo	Nkembo	Nkembo	Nkembo	La Peyrie	La Peyrie	La Peyrie	La Peyrie	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Ngouema	Ngouema	Akouokam	Port Gentil
Species	**TOTAL 21 stalls (kg)**																					
Abelmoschus cf. *moschatus* Medik.	0.03																			0.03		
Abrus precatorius L.	0.05						0.05															
Acanthus montanus (Nees) T.Anderson	0.16																	0.16				
Adenia cf. sp. (DQ 1047)	0.50						0.50															
Adenostemma viscosum J.R.Forst. & G.Forst.	1.20						1.00											0.20				
Aframomum cf. *alboviolaceum* (Ridl.) K.Schum.	0.74						0.12	0.06	0.12	0.24			0.20									
Aframomum cf. *melegueta* K.Schum.	0.40	0.16			0.02		0.01		0.02								0.04		0.04		0.01	0.10
Afrostyrax sp. (DQ 1106)	10.15				0.15									10.00								
Ageratum conyzoides (L.) L.	1.79						0.30					1.50										
Aloe buettneri A.Berger	4.35	4.35																				
Alstonia sp. cf. (AMT 667)	0.73						0.42	0.31														
Anisophyllea sp. (AMT 749)	1.71	0.62					0.53			0.28												0.28
Annickia affinis (Exell) Versteegh & Sosef	25.94	7.98					2.66		0.50	6.65		0.33	1.00		1.00					5.82		
Annona sp. (AMT 1013)	0.24						0.24															

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Type of stall	Herb	Spice	Togo Spice	Spice	Spice	Herb	Herb	Herb	Herb	Herb	Herb	Herb	Cameroon Spice	Ambulant	Benin Herb	Nigeria Bwiti	Herb	Spice	Herb	Spice	Bwiti
	Location	Mont Bouët	Nkembo	Nkembo	Nkembo	Nkembo	La Peyrie	La Peyrie	La Peyrie	La Peyrie	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Ngouema	Ngouema	Akouokam	Port Gentil
Species	**TOTAL 21 stalls (kg)**																					
Anonidium cf. *mannii* (Oliv.) Engl. & Diels	0.29											0.29										
Aoranthe cladantha (K.Schum.) Somers	0.46						0.46															
Asparagus cf. *warneckei* (Engl.) Hutch.	0.10																	0.10				
Aucoumea klaineana Pierre	134.10	14.50					0.33		6.95	12.68	12.19		0.29				68.24			4.51		14.01
Baillonella toxisperma Pierre	2.40	0.70					0.15			0.39										1.16		
Brillantaisia cf. *owariensis* P.Beauv.	0.98											0.98										
Brillantaisia lancifolia Lindau	4.00								1.12			0.32	0.96				0.64	0.96				
Buchholzia coriacea Engl.	1.27	0.92								0.23								0.12				
Caesalpinia bonduc (L.) Roxb.	0.01								0.01													
Canavalia ensiformis (L.) DC.	0.37											0.29	0.08									
Capsicum annuum L.	2.83	0.68					0.13	0.05	0.36	0.31			0.68					0.52				0.10
Carpolobia sp. ("kuta")	0.42	0.42																				
Carpolobia alba G.Don	0.50	0.14																0.35				
Carpolobia lutea G.Don	0.22																					0.22
Ceiba pentandra (L.) Gaertn.	3.46										3.46											
Cola acuminata (P.Beauv.) Schott & Endl.	2.76	0.72					0.60						1.44									
Combretum sp.	0.92						0.73						0.18									
Copaifera religiosa J.Leonard	21.69	2.47					1.73	3.94		9.86										3.70		

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Type of stall	Herb	Spice	Togo Spice	Spice	Spice	Herb	Herb	Herb	Herb	Herb	Herb	Herb	Cameroon Spice	Ambulant	Benin Herb	Nigeria Bwiti	Herb	Spice	Herb	Spice	Bwiti
	Location	Mont Bouët	Nkembo	Nkembo	Nkembo	Nkembo	La Peyrie	La Peyrie	La Peyrie	La Peyrie	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Ngouema	Ngouema	Akouokam	Port Gentil
Species	**TOTAL 21 stalls (kg)**																					
Costus cf. *afer* Ker Gawl.	0.68																	0.68				
Costus lucanusianus J.Braun & K.Schum.	0.89												0.71					0.18				
Costus phyllocephalus K.Schum.	0.31																	0.31				
Coula edulis Baill.	0.02									0.02												
Croton oligandrus Pierre ex Hutch.	12.10									6.05			1.41							4.64		
Croton tiglium L.	0.20	0.20																				
Cucumeropsis mannii Naudin	0.90																		0.84		0.06	
Cylicodiscus gabunensis Harms	8.18						1.77													0.88		5.53
Cymbopogon citratus (DC.) Stapf	5.40														2.40	3.00						
Cymbopogon densiflorus (Steud.) Stapf	2.18	0.50							0.29	0.21		0.08	0.08				1.00					
Cyperus articulatus L.	0.15												0.07					0.09				
Daniellia klainei A.Chev.	13.69								6.74				0.22									6.74
Desmodium adscendens (Sw.) DC.	0.73												0.52					0.21				
Detarium macrocarpum Harms	0.30	0.25																		0.05		
Dialium cf. *guineense* Willd.	2.05																			2.05		
Dinophora spenneroides Benth.	0.21																	0.21				
Dioclea cf. *reflexa* Hook.f.	0.05								0.01	0.04												
Dioscorea sp. cf.	0.15						0.15															

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Type of stall	Herb	Spice	Togo Spice	Spice	Spice	Herb	Herb	Herb	Herb	Herb	Herb	Herb	Cameroon Spice	Ambulant	Benin Herb	Nigeria Bwiti	Herb	Spice	Herb	Spice	Bwiti
	Location	Mont Bouët	Nkembo	Nkembo	Nkembo	Nkembo	La Peyrie	La Peyrie	La Peyrie	La Peyrie	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Ngouema	Ngouema	Akouokam	Port Gentil
Species	**TOTAL 21 stalls (kg)**																					
Distemonanthus benthamianus Baill.	11.22								0.63	1.58		3.48										5.53
Dorstenia psilurus Welw.	1.35	0.56					0.54		0.07	0.19												
Drypetes gossweileri S.Moore	9.95									3.06										6.89		
Duboscia macrocarpa Bocq.	0.83		0.05							0.18							0.60					
Elaeis guineensis Jacq.	0.75								0.60			0.15										
Elytraria marginata Vahl	2.51						0.31		0.47	0.94								0.78				
Emilia coccinea (Sims) G.Don	0.25						0.25															
Entada gigas (L.) Fawc. & Rendle	0.42	0.24								0.18												
Erythrophleum ivorense A.Chev.	11.13	1.45					4.84					1.94								2.90		
Ficus thonningii Blume	0.20																0.20					
Fleroya ledermannii (K.Krause) Y.F.Deng	2.59																					2.59
Garcinia kola Heckel	8.73																		4.70		4.03	
Garcinia lucida Vesque	16.50	12.69																		3.81		
Geophila afzelii Hiern	0.31						0.31															
Gnaphalium sp.	0.07												0.07									
Greenwayodendron cf. *suaveolens* (Engl. & Diels) Verdc.	0.03																			0.03		
Guibourtia tessmannii (Harms) J.Leonard	8.20						1.14			0.76		1.91	2.10							2.29		
Harungana madagascariensis Lam. ex Poir.	7.80	1.39					1.39			2.78		0.56	1.68									

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Type of stall	Herb	Spice	Togo Spice	Spice	Spice	Herb	Herb	Herb	Herb	Herb	Herb	Herb	Cameroon Spice	Ambulant	Benin Herb	Nigeria Bwiti	Herb	Spice	Herb	Spice	Bwiti
	Location	Mont Bouët	Nkembo	Nkembo	Nkembo	Nkembo	La Peyrie	La Peyrie	La Peyrie	La Peyrie	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Ngouema	Ngouema	Akouokam	Port Gentil
Species	**TOTAL 21 stalls (kg)**																					
Heinsia crinita (Afzel.) G.Taylor	2.75						0.92											1.84				
Hibiscus surattensis L.	0.36																	0.36				
Irvingia gabonensis (Aubry-Lecomte ex O'Rorke) Baill.	5.44					5.00	0.44															
Kalanchoe crenata (Andrews) Haw.	1.88							0.16	1.57			0.16										
Keetia sp. (AMT 690)	0.70							0.46														0.23
Lagenaria breviflora (Benth.) Roberty	0.14								0.14													
Lagenaria siceraria (Molina) Standl.	0.34																0.34					
Lannea barteri (Oliv.) Engl.	0.17															0.17						
Lasianthera africana P.Beauv.	4.86						0.54	0.54				0.18	3.60									
*Ledebouria cameroonian*a (Baker) Speta	0.18											0.18										
Leea guineensis G. Don	0.74												0.74									
Lippia rugosa A.Chev.	3.65	0.52					0.35		1.91			0.52						0.35				
Macaranga monandra Müll.Arg.	0.14																	0.14				
Massularia acuminata (G.Don) Bullock ex Hoyle	10.07						0.95	1.53	0.44	2.34		2.92	0.44									1.46
Meiocarpidium lepidotum (Oliv.) Engl. & Diels	0.35																			0.35		
Microdesmis cf. *puberula* Hook.f. ex Planch.	0.94						0.54						0.40									
Mikania chenopodifolia Willd.	0.30																	0.30				

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Type of stall	Herb	Spice	Togo Spice	Spice	Spice	Herb	Herb	Herb	Herb	Herb	Herb	Herb	Cameroon Spice	Ambulant	Benin Herb	Nigeria Bwiti	Herb	Spice	Herb	Spice	Bwiti
	Location	Mont Bouët	Nkembo	Nkembo	Nkembo	Nkembo	La Peyrie	La Peyrie	La Peyrie	La Peyrie	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Ngouema	Ngouema	Akouokam	Port Gentil
Species	**TOTAL 21 stalls (kg)**																					
Momordica charantia L.	1.13	0.10					0.63															0.40
Monodora myristica (Gaertn.) Dunal	18.29	1.69			1.00		1.00		0.60	0.40			1.10	10.00			2.00		0.30		0.10	0.10
Morinda lucida Benth.	0.50															0.50						
Mostuea hirsuta (T.Anderson ex Benth.) Baill.	0.65						0.29		0.17	0.19												
Musanga cecropioides R.Br. ex Tedlie	0.43												0.43									
Mussaenda sp. (DQ 1099)	0.35																	0.35				
Myrianthus serratus (Trécul) Benth.	2.12									0.53		0.18	0.53					0.89				
Nauclea diderrichii (De Wild.) Merr.	0.42											0.04	0.05							0.33		
Newbouldia laevis (P.Beauv.) Seem.	4.05						1.67			2.38												
Nicotiana tabacum L.	0.72	0.18								0.36							0.18					
Ocimum americanum L.	1.61							0.48	0.22	0.52		0.39										
Ocimum gratissimum L.	0.31																	0.31				
Panax sp. (AMT 782)	0.06	0.06																				
Panda oleosa Pierre	0.38						0.38															
Pandanus sp. (AMT 1027)	0.03								0.03													
Passiflora quadrangularis L.	6.00																	6.00				
Paullinia pinnata L.	1.17						0.26						0.91									
Pentaclethra macrophylla Benth.	17.46						1.93		0.10	2.03			0.42							1.82		11.17

Appendix 2: Weight of plant species recorded for sale in Gabon per market stall

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Type of stall	Herb	Spice	Togo Spice	Spice	Spice	Herb	Herb	Herb	Herb	Herb	Herb	Herb	Cameroon Spice	Ambulant	Benin Herb	Nigeria Bwiti	Herb	Spice	Herb	Spice	Bwiti
	Location	Mont Bouët	Nkembo	Nkembo	Nkembo	Nkembo	La Peyrie	La Peyrie	La Peyrie	La Peyrie	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Ngouema	Ngouema	Akouokam	Port Gentil
Species	**TOTAL 21 stalls (kg)**																					
Periploca nigrescens Afzel	0.10						0.10															
Piptadeniastrum africanum (Hook.f.) Brenan	1.02											0.51								0.51		
Pityrogramma calomelanos (L.) Link	0.31																	0.31				
Plagiostyles africana (Müll.Arg.) Prain	1.44											1.44										
Prosopis africana (Guill. & Perr.) Taub.	0.66															0.66						
Pseudospondias cf. *longifolia* Engl.	0.18						0.18															
Psidium guajava L.	0.71											0.18	0.53									
Psydrax palma (K.Schum.) Bridson	0.79											0.26	0.52									
Pteleopsis suberosa Engl. & Diels	1.36															1.36						
Pterocarpus soyauxii Taub.	9.50	0.63					1.81	0.81		2.44		1.81	0.81				1.00					0.18
Pycnoporus sanguineus (L.) Murrill	0.07							0.07														
Quassia africana (Baill.) Baill.	1.51	1.06						0.25				0.20										
Raphia sp. ("flambout")	54.00						6.00		21.00	1.00							6.00					20.00
Raphia sp. (DQ 976)	0.17	0.17																				
Ricinodendron heudelotii (Baill.) Heckel	10.12				0.12									10.00								
Rinorea sp. cf. (AMT 665)	6.10						2.30	0.60	2.20	1.00												
Sarcocephalus latifolius (Sm.) E.A.Bruce	0.31															0.31						
Scleria boivinii Steud.	0.09								0.09													

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Type of stall	Herb	Spice	Togo Spice	Spice	Spice	Herb	Herb	Herb	Herb	Herb	Herb	Herb	Cameroon Spice	Ambulant	Benin Herb	Nigeria Bwiti	Herb	Spice	Herb	Spice	Bwiti
	Location	Mont Bouët	Nkembo	Nkembo	Nkembo	Nkembo	La Peyrie	La Peyrie	La Peyrie	La Peyrie	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Ngouema	Ngouema	Akouokam	Port Gentil
Species	**TOTAL 21 stalls (kg)**																					
Scoparia dulcis L.	4.56						0.54															4.02
Scorodophloeus zenkeri Harms	0.45			0.23	0.14								0.09									
Secamone afzelii (Roem. & Schult.) K.Schum.	1.25							0.78					0.16					0.31				
Selaginella myosurus Alston	1.88											0.31	1.41					0.16				
Senna alata (L.) Roxb.	0.12											0.05						0.07				
Solanum anguivi Lam.	0.12							0.12														
Sorghum bicolor (L.) Moench	0.33															0.33						
sp. Araceae (AMT 1035)	0.06									0.03		0.03										
sp. cf. Humiriaceae (AMT 1028)	0.33								0.02			0.14								0.18		
Spermacoce sp.	0.37												0.37									
Streptogyna crinita P.Beauv.	0.01																					0.01
Strychnos icaja Baill.	0.30											0.30										
Synclisia scabrida Miers	0.60	0.04							0.06	0.39		0.12										
Tabernanthe iboga Baill.	7.16						3.40	0.30		1.00		0.80	0.66									1.00
Tephrosia vogelii Hook.f.	0.46						0.08	0.19	0.08			0.04						0.08				
Terminalia catappa L.	7.95		2.00				0.50			5.20												0.25
Tetrapleura tetraptera (Schum. & Thonn.) Taub.	14.42	1.14					0.57	0.75	1.00	2.00		0.53	1.67	5.00			0.44			0.44		0.88
Thomandersia sp.	0.32						0.32															

Appendix 2: Weight of plant species recorded for sale in Gabon per market stall

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Type of stall	Herb	Spice	Togo Spice	Spice	Spice	Herb	Herb	Herb	Herb	Herb	Herb	Herb	Cameroon Spice	Ambulant	Benin Herb	Nigeria Bwiti	Herb	Spice	Herb	Spice	Bwiti
	Location	Mont Bouët	Nkembo	Nkembo	Nkembo	Nkembo	La Peyrie	La Peyrie	La Peyrie	La Peyrie	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Mont Bouët	Ngouema	Ngouema	Akouokam	Port Gentil
Species	**TOTAL 21 stalls (kg)**																					
unidentified ("kandila")	0.01											0.01										
unidentified ("milangi")	0.87												0.87									
unidentified (AMT 1006)	0.01						0.01															
unidentified (AMT 1041)	0.03											0.03										
unidentified (AMT 1047)	1.28												1.28									
unidentified (AMT 1353)	0.30																					0.30
unidentified (AMT 1354)	0.03																					0.03
unidentified (AMT 787)	0.41	0.04						0.14		0.06		0.02	0.01							0.14		
unidentified (AMT 940)	1.43																			1.43		
Vernonia amygdalina Delile	0.78																	0.78				
Xylopia aethiopica (Dunal) A.Rich.	13.62	1.84							0.94	1.57	1.14						6.38		0.10	0.34		1.31
Zanthoxylum cf. *heitzii* (Aubrév. & Pellegr.) P.G.Waterman	1.31									1.31												
Zingiber officinale Roscoe	1.58								0.34												1.24	
TOTAL kilograms on all stalls	595.28	58.43	2.05	0.23	1.43	5.00	46.36	11.56	48.79	71.37	16.78	23.14	28.70	35.00	3.40	6.33	87.06	17.12	5.98	44.28	5.43	76.43