

MONODOMINANT FORESTS OF *AUCOUMEA KLAINEANA* AND *TERMINALIA SUPERBA* IN THE CHAILLU FOREST (SW CONGO, AFRICA)

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Abstract: The paper describes the vegetation types observed in the Ngoua 2 Forest. Analysis of floristic composition led to identification of four vegetation types there: monodominant forest of *Terminalia superba* and of *Aucoumea klaineana*, mixed forest and swamp forest. Two other vegetation types, secondary forest and riverine forest, exist in the outer fringes of the study site. The collected plants represent 451 species (296 genera, 91 families), of which 436 were identified completely. Nine plant species were added to the flora of the Chaillu Forest. A checklist of the vascular plants collected and identified in the Ngoua 2 Forest is provided.

Key words: Flora, vegetation, *Terminalia superba*, *Aucoumea klaineana*, Chaillu Forest, Africa

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INTRODUCTION

The Republic of Congo (Brazzaville) is located in the central part of the African continent. It covers an area of about 342,000 km², straddling the equator between 3°34' N–5°00' S latitude and 11°11' E–18°35' E longitude. The density of the human population in the southwestern forested area is very low, and most of the area remains undisturbed. The climate is equatorial, though varying according to the altitude. Rainfall in the central and southern regions has bimodal peaks in November and May. In the northern regions the latter peak appears in September through October (Vennetier 1977). Annual rainfall ranges from 1200 mm at Plaine du Niari in the south to 2000 mm around Plateau Koukouya in the central area near Gabon. Mean annual temperature is between 23°C and 27°C (Vennetier 1977). There are two major vegetation types: tropical rainforest and savannah. Tropical forest covers 60% of the total area: Mayombe Forest (3%), Chaillu Forest (11%), the northern forests (31%) and other forests (15%). Savannah, grasslands and swamps cover about 35% of the remainder (Vennetier 1977).

Botanical surveys in Mayombe Forest and the central region have been carried out (Descoings

1960; Bouquet 1967, 1977; Cusset 1989) except in the areas bordering Cabinda (Mayombe Forest) and Gabon (Chaillu Forest). The surveys have recorded about 4500 plant species (Sita & Moutsamboté 1988). On the other hand, areas of the northern Congo such as Cuvette, Sangha and Likouala districts are least surveyed, except for the southernmost area of Sangha (Moutsamboté 1991a, b). This incomplete knowledge of Congolese flora hinders assessment of its degree of diversity and endemism.

The Ngoua 2 Forest is a region of transition between the *Aucoumea klaineana* and *Terminalia superba* distribution areas (Leroy-Deval 1977; Croisé & Fabri 1991). The separation of the two species is not abrupt but gradual from west (*Terminalia superba*) to east (*Aucoumea klaineana*) (Aubreville 1948; Bouquet 1967; Teillier 1994). Botanical surveying in the southern Congo, mainly in the Ngoua 2 Forest (Chaillu Forest) started in 1994. This effort confirmed that the southern regions, in particular the Ngoua 2 Forest, have much potential for plant taxonomy (Aubréville 1938; Adjanahoun *et al.* 1998) and other botanical fields.

STUDY SITE

The Ngoua 2 Forest is located in southern Congo in the Chaillu Forest (Fig. 1). It covers about 260,000 ha (Groulez 1982), is located at 02°56'39" S latitude and 12°20'20" E longitude, and has an altitude range of 250–300 m. Elevation decreases in the southwest of the area. The climate is humid, and annual rainfall ranges from 1600 to 1800 mm. Mean annual temperatures are between 23°C and 25°C (Aubréville 1948; Vennetier 1977). The rivers have wide flood plains dominated by swamp forest along them. The soils on the plateaus are primarily ferric oxisols, and the valleys mostly hydromorphic ferric oxisols (Babet 1929, 1932; Devigne 1959).

MATERIALS AND METHODS

All botanical samples were collected in the southwestern part of the forest, from both the right and left banks of the upper Loufoula River. Sampling was done both systematically (along transects) and opportunistically. The data from transects are now under study. B. Fayette Mikano and N. G. Massanga identified the specimens at the Centre d'Etudes sur les Ressources Végétales

(C.E.R.V.E.) in Brazzaville and at the Faculté des Sciences (Botanical Department) in Kinshasa (Democratic Republic of Congo), respectively. Voucher specimens are deposited in the Herbarium of C.E.R.V.E. and the Herbarium of la Faculté des Sciences (Kinshasa). For description of the dominant tree species, trees 30 cm DBH (diameter breadth higher) or more were selected. The list of plants (see APPENDIX) shows scientific and vernacular names (Punu). Nomenclature follows the integrated system of classification of flowering plants by Cronquist (1981).

RESULTS AND DISCUSSION

VEGETATION TYPES

The following four vegetation types are distinguished by species composition at the study site (for the distribution of vegetation types, see Groulez 1982):

1. Monodominant forest of *Terminalia superba*. This type, dominated by *Terminalia superba*, can be classified into two subtypes: riverine *Terminalia superba* forest (called *mulimba* in the Punu language; it generally has black heartwood) and inland *Terminalia superba* forest, which has the best wood (Teillier 1994; Vigneron 1984). In the riverine subtype, more than 80% of the trees

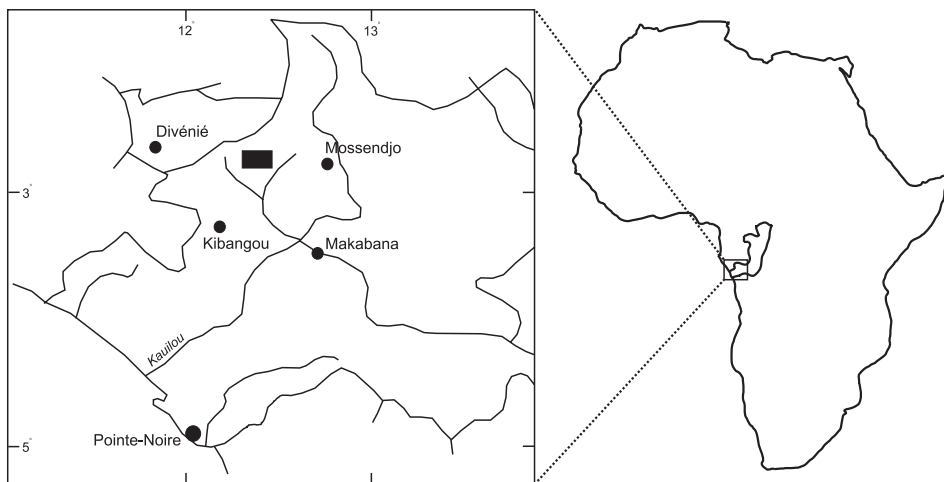


Fig. 1. Situation of the Ngoua 2 Forest, SW Congo, Africa (black rectangle).

and 92% of the basal area of DBH (should be explained what is DBH) and 92% of DBH consist of a single species, *Terminalia superba*. In one 2 ha area, Pangou-Tchiami and Sengolt (1988) recorded 127 tree species with DBH greater than 10 cm; trees with DBH greater than 60 cm were found only in mature forests. In the inland subtype, more than 75% of the trees and 85% of the basal area of DBH and 85% of DBH consist of a single species, *Terminalia superba* (Pangou et al. 1988; Mellinger 1993; Loumeto 1997). The canopy of the two subtypes is not always continuous, and gaps are common in the inland subtype. The dominant terrestrial vegetation consists of species of the Commelinaceae (*Aneilema beni-niensis*, *Commelina diffusa*, *Palisota* sp.), Marantaceae (*Ataenidia conferta*, *Marantochloa* sp., *Megaphrynium macrostachyum*) and Zingiberaceae (*Aframomum* sp., *Costus afer*) in both subtypes. Their densities are markedly higher in the inland than in the riverine subtype. The community of *Terminalia superba* forms part of the *Musango-Terminalietea* association (Lebrun & Gilbert 1954), which is fully integrated in the moist semi-deciduous forest. *Terminalia superba* also forms a compact riverside community along minor watercourses of the whole Loufoula River, sometimes accompanied by formations of other species such as *Pterocarpus soyauxii*, *Swartzia fistuloides*, *Gambeya* sp., *Letestua durissima* and *Symphonia globulifera*.

2. Monodominant forest of *Aucoumea klaineana*. This type, dominated by *A. klaineana*, is called *mukume* or *okoumé* in the Punu language. The inland subtype is the important one at the site. *Aucoumea klaineana* is rare along streams (Groulez 1963). Teillier (1994) regarded the community of *A. klaineana* as the final stage of a progressive series, that is, the climax of the Ngoua 2 region, with the involvement, to different extents, of other Burseraceae such as *Dacryodes büttneri*, *D. heterotricha*, *D. letestui* and *D. klaineana*. More than the 86% of the trees and 95% of the basal area of DBH and 95% of DBH consist of a single species of *A. klaineana* (Loumeto 1997; Pangou et al. 1988). The canopy is always continuous and large forest gaps are rare. The dominant terrestrial

species in this type of forest belong the Agavaceae (*Dracaena humilis*), Araceae (*Anubias hastifolia*, *Culcasia scandens*), Commelinaceae (*Palisota ambigua*, *P. hirsute*, *P. thollonii*, *Pollia condensata*), Costaceae (*Costus afer*, *C. lucanusianus*), Zingiberaceae (*Aframomum citratum*, *A. giganteum*, *A. letestuanum* and *Renalmia polypus*). It usually lies next to dominant forest of the inland *Terminalia superba* subtype.

3. Swamp forest is developed along streams. The forest floor is almost inundated. The canopy is open for the most part. The dominant species are *Mitragyna ciliata*, *M. stipulosa*, *Nauclea pobeguinii*, *Stipularia africana* (Rubiaceae), *Uapaca heudelotii*, *U. guineensis*, *U. palustre* (Euphorbiaceae), *Symphonia globulifera* (Clusiaceae), *Alstonia boonei* (Apocynaceae) and *Xylopia rubescens* (Annonaceae). The inundated forest floor is often covered with species of the Cyperaceae and Poaceae. In this study, vegetation near dry land but inundated permanently was simply classified as swamp. However, such vegetation is complex and may be subdivided further. One subtype of swamp forest is large clearings, called marshy grass in Mitani et al. (1993). It usually lies next to the riverine subtype of monodominant forest of *Terminalia superba*. The clearing is usually covered by herb species: *Anubias hastifolia* (Araceae), *Commelina diffusa* (Commelinaceae), *Kyllinga pungens*, *Pycneus subtrigonus*, *Rhynchospora corymbosa*, *R. rugosa*, *Cyperus* sp. (Cyperaceae), *Dinophora spennoroides*, *Heterotis rotundifolia* (Melastomataceae), *Acroceras amplexans* (Poaceae) and *Xyris* sp. (Xyridaceae).

4. Mixed forest occupies large areas of the study site. This type is more diverse in plant composition than the other types. The canopy is not always continuous and large forest gaps are abundant. It is a transition area of the two species. They are mixed and rarely represented alone. The area includes primary, secondary and logged-over forests. Both dominant tree species are distinctly megathermic species of considerable height (35–40 m) with a leafy crown throughout, often gregarious, resulting in a small number of species associated in the upper layer and a certain floristic poverty in the true arborescent nucleus [the mean

number of species per hectare, however, is always high, for example 15 per are (Setzer 1988)].

In forest the dominant species generally have characteristically large seeds and shade-tolerant seedlings (Hart *et al.* 1989). This is not the case for *Terminalia superba* and *Aucoumea klaineana*. Both species have high dissemination of light diaspores and no shade-tolerant seedlings. Similar monodominant tropical forests are widespread in the African (Pierlot 1966; Lubini & Mandango 1981; Lubini 1985; Apema *et al.* 1994; Sokpon & Lejoly 1994), Asian (Kartawinata & Riswan 1981; Riswan 1982; Riswan & Yusuf 1986) and American tropics (Maas 1971; Lescure 1981). Dominant trees species in this type of forest belong to the Leguminosae (*Piptadeniastrum africanum*, *Pterocarpus soyauxii*, *Baphia densiflora*, *Gilbertiodendron dewevrei*) and Euphorbiaceae (*Antidesma ripicola*, *Drypetes* sp., *Macaranga* sp.). Other groups such as Meliaceae (*Entandrophragma angolense*, *E. candollei*, *E. cylindricum*, *E. utile*, *Guarea* sp. and *Trichilia hirta* are also distributed throughout this type of forest. Locally abundant species include *Terminalia superba* (Combretaceae), *Triplochiton scleroxylon* (Sterculiaceae), *Aucoumea klaineana* (Burseraceae), *Xylopia* spp. (Annonaceae) and *Diospyros* spp. (Ebenaceae). Several species found in gaps are also found in secondary forest. *Musanga cecropioides* (Cecropiaceae) is present in a certain part of the study site but is not dense. Terrestrial vegetation is generally dense and dominated by species of Commelinaceae (*Palisota* spp.) and Marantaceae. This type of forest may be divided further into several subtypes.

Besides the four vegetation types above, two additional types are found in the outer fringes of the study site: secondary forest and riverine forest. Secondary forest is found in places affected by human activity between Ngoua 2 village and the Loufoula River, a tributary of the Nyanga River. Common species are *Musanga cecropioides* (Cecropiaceae), *Terminalia superba* (Combretaceae), *Aucoumea klaineana*, *Dacryodes pubescens* (Burseraceae), *Rothmannia* spp. (Rubiaceae), *Anonidium mannii* (Annonaceae) and several species of Leguminosae and Sapotaceae. Secondary forest

dominated by *Musanga cecropioides* is found near the village. The Zingiberaceae, Marantaceae, and Commelinaceae include dominant species on the forest floor. Riverine forest is the other type. This type of forest develops along the Nyanga River, but not along the Loufoula River. The dominant trees in this type are *Lophira alata* (Ochnaceae), *Saccoglottis gabonensis* (Humiriaceae), *Guibourtia demeusei* (Caesalpiniaceae), *Uapaca* spp. (Euphorbiaceae) and *Xylopia* spp. (Annonaceae).

SPECIES RECORDED

Ninety-one families, 296 genera and 451 species were collected. Of these, 436 were identified completely (see APPENDIX). Nine species were newly recorded in the flora of Congo, mainly in the southern Congo: *Baphia densiflora* (Papilionaceae), *Borassus aethiopum* (Arecaceae), *Detarium macrocarpum* (Caesalpiniaceae), *Diospyros suaveolens* (Ebenaceae), *Gambeya boukokoensis* (Sapotaceae), *Talinum triangulare* (Portulacaceae), *Haumania danckelmaniana* (Marantaceae), *Isobertlinia doka* (Caesalpiniaceae) and *Vernonia titanophylla* (Asteraceae).

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APPENDIX

A checklist of plants identified in the Ngoua 2 Forest and their vernacular names (Punu).

Species	Vernacular name (Punu)
PTERIDOPHYTA	
Adiantaceae	
<i>Pityrogramma calomelanos</i> (L.) Link	Jefame
Davalliaceae	
<i>Arthropteris monocarpa</i> (Cord.) C. Chr.	poso
<i>Oleandra distenta</i> Kuntze	muliba
Lomariopsidaceae	
<i>Bolbitis gaboensis</i> (Hook.) Alston	japani
<i>Lomariopsis congoensis</i> Holttum	miana
Nephrolepidaceae	
<i>Nephrolepis bisserata</i> (Sw.) Chott	—
Polypodiaceae	
<i>Lonchitis currori</i> (Hook. f.) Mett. ex Kuhn	—
<i>Platyserium angolense</i> Welw. ex Hook.	hong
<i>Platyserium stemaria</i> (P. Beauv.) Desc.	yonyon
Pteridaceae	
<i>Pteridium aquilinum</i> var. <i>caudatum</i> (L.) Kuhn	mumbulu
SPERMATOPHYTA	
GYMNOSPERMAE	
Gnetaceae	
<i>Gnetum africanum</i> Welw.	koko
<i>Gnetum buchholzianum</i> Engl.	koko

APPENDIX. *Continued.*

Species	Vernacular name (Punu)
ANGIOSPERMAE	
DICOTYLEDONEAE	
Acanthaceae	
<i>Acanthus montanus</i> (Nees) T. Anders.	mbaka
<i>Adhatoda buchholzii</i> (Lindau) S. Moore	dolu
<i>Crossandra guineensis</i> Nees	gindii
<i>Pseuderanthemum ludovicianum</i> (Buttner) Lindau	ndindi
<i>Thomandersia laurifolia</i> (T. Anders. ex Benth.) Baill.	ngoka
<i>Whitfieldia elongata</i> (P. Beauv.) De Wild. & T. Dur.	nsinde
Anacardiaceae	
<i>Antrocaryon klaineum</i> Pierre	mbondo
<i>Antrocaryon micraster</i> A. Chev. & Guillaum.	muyabi
<i>Lannea welwitschii</i> (Hiern) Engl.	okoumbi
<i>Trichoscypha acuminata</i> Engl.	indoya
<i>Trichoscypha ferruginea</i> Engl.	ndoye
Annonaceae	
<i>Anonidium mannii</i> (Oliv.) Engl. & Diels	obeye
<i>Cleistopholis patens</i> (Benth.) Engl. & Diels	sobu
<i>Exellia scammopetala</i> (Exell) Boutique	sabu
<i>Friesodielsia enghiana</i> (Diels) Verdc.	sendji
<i>Isolona hexaloba</i> (Pierre) Engl. & Diels	jingo
<i>Isolona le-testui</i> Pellegr.	Yombo/iono
<i>Monodora angolensis</i> Welw.	Yiongo
<i>Pachypodianthum confine</i> Engl. & Diels	Gingo
<i>Polyalthia suaveolens</i> Engl. & Diels	Botanga
<i>Uvaria brazzavillensis</i> A. Chev.	ndinga
<i>Uvaria comperei</i> Le Thomas	ndinga
<i>Uvariastrum insculptum</i> (Engl. & Diels) Spr. & Hutch.	pota
<i>Uvariastrum pierreanum</i> Pierre	pota
<i>Xylopia aethiopica</i> (Dunal) A. Rich.	–
<i>Xylopia hypolampra</i> Mildbr.	sange
<i>Xylopia rubescens</i> Oliv. var. <i>rubescens</i>	lingbue
<i>Xylopia vallonii</i> Chipp ex Hutch. & Dalz.	iyombo
Apocynaceae	
<i>Alstonia boonei</i> De Wild.	nguka/ngoka
<i>Alstonia congensis</i> Engl.	nguka
<i>Anthoclitandra robustior</i> (K. Schum.) Pichon	ibolu/ibolo
<i>Baissea axilaris</i> (Benth.) Hua	mbolo
<i>Clitandra cymulosa</i> Benth.	ibubue
<i>Funtumia africana</i> (Benth.) Stapf	bonu
<i>Funtumia elastica</i> (Preuss) Stapf	ndama
<i>Landolphia foretiana</i> (Pierre ex Jum.) Pichon	indembo
<i>Landolphia jumellei</i> (Pierre ex Jum.) Pichon	indembo
<i>Landolphia owariensis</i> P. Beauv.	ipembe
<i>Picralima nitida</i> (Stapf) Th. & H. Durand	imbembo
<i>Pleiocarpa mutica</i> Benth.	mosebe

(cont.)

APPENDIX. *Continued.*

Species	Vernacular name (Punu)
<i>Pycnobotrya nitida</i> Benth.	mtengue
<i>Rauvolfia mannii</i> Stapf	maka
<i>Saba comorensis</i> (Boj.) Pichon var. <i>florida</i> (Benth.) Pichon	masenda
<i>Tabernaemontana crassa</i> Benth.	tokoloko
<i>Tabernaemontana penduliflora</i> K. Schum.	dongo
<i>Tabernanthe iboga</i> Baill.	itofolo
Araliaceae	
<i>Cussonia</i> sp.	—
<i>Schefflera barteri</i> (Seem.) Harms	tchiami
Asteraceae (Compositae)	
<i>Chromolaena odorata</i> L.	idakeli
<i>Conyza sumatrensis</i> (Retz.) Walker	sebu
<i>Vernonia amygdalina</i> Del.	kongonduli
<i>Vernonia conferta</i> Benth.	ieba
<i>Vernonia titanophylla</i> Brenan	igogolo
Balanitaceae	
<i>Balanites wilsoniana</i> Dave & Sprague	ibiwala
Balanophoraceae	
<i>Thonningia sanguinea</i> Vahl	ibaidengue
Balsaminaceae	
<i>Impatiens irvingii</i> Hook. f.	ilele
Begoniaceae	
<i>Begonia alepensi</i> A. Chev.	imili
<i>Begonia ampla</i> Hook. f.	mili
<i>Begonia eminii</i> Warb.	miangula
<i>Begonia mannii</i> Hook. f.	iimli mio
Bignoniaceae	
<i>Markhamia tomentosa</i> (Benth.) K. Schum. & Thonn.	—
Bombacaceae	
<i>Ceiba pentandra</i> (L.) Gaertn.	mukondo
Burseraceae	
<i>Aucoumea klaineana</i> Pierre	mukume
<i>Canarium schweinfurthii</i> Engl.	tete
<i>Dacryodes edulis</i> H. J. Lam	musafu
<i>Dacryodes klaineana</i> H. J. Lam	nsake
<i>Dacryodes letestui</i> Pellegr.	isafu
<i>Dacryodes pubescens</i> (Verm.) H. J. Lam	safoukala
<i>Santiria trimera</i> (Oliv.) Aubr.	—
Caesalpiniaceae	
<i>Amphimas ferrugineus</i> Pierre ex Pellegr.	molinda
<i>Anthonotha macrophylla</i> P. Beauv.	molinda
<i>Daniellia soyauxii</i> (Harms) Rolfe	—
<i>Detarium macrocarpum</i> Harms	—

APPENDIX. *Continued.*

Species	Vernacular name (Punu)
<i>Dialium bipidense</i> Harms	—
<i>Dialium pachyphyllum</i> Harms	—
<i>Dialium polyanthum</i> Harms	mubli
<i>Dialium tessmannii</i> Harms	ibaba
<i>Dialium</i> sp.1	baso/ibasus
<i>Dialium</i> sp. 2	basu
<i>Distemonanthus benthamianus</i> Baill.	basu
<i>Erythrophleum ivorense</i> A. Chev.	basu
<i>Gilbertiodendron dewevrei</i> (De Wild.) J. Léonard	movingui
<i>Guibourtia demeuseui</i> (Hams) J. Léonard	mbembo
<i>Isobberlinia doka</i> Craib & Stapf	ibembo
<i>Oxystigma oxyphyllum</i> (Harms) J. Léonard	banda
<i>Pachyelasma tessmannii</i> (Harms) J. Léonard	—
<i>Tessmannia africana</i> Harms	ifofolo
<i>Tessmannia anomala</i> (Micheli) Harms	igondus
<i>Senna alata</i> (L.) Roxb.	imbo
<i>Senna occidentalis</i> (L.) Link	ipaka
Cecropiaceae	
<i>Musanga cecropioides</i> R. Br.	kombo
<i>Myrianthus arboreus</i> P. Beauv.	mububa
Chrysobalanaceae	
<i>Parinari excelsa</i> Sabine	bokanja
Combretaceae	
<i>Combretum racemosum</i> P. Beauv.	—
<i>Combretum</i> sp.	itoke
<i>Terminalia superba</i> Engl. & Diels	mulimba
Connaraceae	
<i>Agelaea dewevrei</i> De Wild. & Th. Dur	elende
<i>Agelaea villosiflora</i> Schellenb.	elende
<i>Byrsocarpus dinklagei</i> (Gilg) Schellenb.	ilolo
<i>Castanola paradoxa</i> (Gilg) Schellenb. ex Hutch. & Dalz.	—
<i>Cnestis ferruginea</i> Vahl ex DC.	ivende
<i>Manotes pruinosa</i> Gilg	pulpu
<i>Roureopsis obliquifoliolata</i> (Gilg) Schellenb.	iliane
Convolvulaceae	
<i>Calycobolus africana</i> (G. Don) Heine	—
<i>Ipomoea involucreta</i> P. Beauv.	mbal
<i>Ipomoea nil</i> (L.) Roth	mbala
<i>Neuropeltis velutina</i> Hall. f.	mbwi
Cucurbitaceae	
<i>Cogniauxia podolaena</i> Baill.	—
<i>Luffa cylindrica</i> (L.) M. J. Roem.	—
Dichapetalaceae	
<i>Dichapetalum brazzae</i> Pellegr.	—

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APPENDIX. *Continued.*

Species	Vernacular name (Punu)
Dilleniaceae	
<i>Tetracera potatoria</i> Afzel. ex G. Don	ikentina
Ebenaceae	
<i>Diospyros crassiflora</i> Hiern	Ilembe
<i>Diospyros dendo</i> Welw. ex Hiern	Imosisi
<i>Diospyros iturensis</i> (Gürke) R. Letouzey & F. White	Ibangu
<i>Diospyros longiflora</i> R. Letouzey & F. White	Imbola
<i>Diospyros piscatoria</i> Gürke	Babanga
<i>Diospyros suaveolens</i> Gürke	Ikokola
Euphorbiaceae	
<i>Alchornea cordifolia</i> (Schum. & Thonn.) Müll.Arg.	–
<i>Alchornea floribunda</i> Müll.Arg.	Ibonji
<i>Antidesma laciniatum</i> Müll.Arg.	Bonji
<i>Antidesma ripicola</i> J. Léonard	Imonge
<i>Croton haumanianus</i> J. Léonard	kenia
<i>Crotonogyne</i> sp.	Isse
<i>Dichostemma glaucescens</i> Pierre	Ibodame
<i>Drypetes chevalieri</i> Beille	–
<i>Drypetes cinnabarina</i> Pax ex Hoffm. var. <i>congolensis</i> J. Léonard	–
<i>Drypetes gossweileri</i> S. Moore	zoline
<i>Drypetes laciniata</i> (Pax) Hutch.	liambu
<i>Drypetes leonensis</i> (Pax) K. Hoffm.	bahebang
<i>Drypetes paxii</i> Hutch.	tambu
<i>Drypetes pellegrinii</i> Léonard	baso
<i>Drypetes pierreana</i> Hutch.	mokakaye
<i>Macaranga barteri</i> Müll.Arg.	lambini
<i>Macaranga monandra</i> Müll.Arg.	bete
<i>Macaranga saccifera</i> Pax	musasale
<i>Macaranga schweinfurthii</i> Pax	musasale
<i>Macaranga spinosa</i> Müll.Arg.	musasale
<i>Manniophyton fulvum</i> Müll.Arg.	musasale
<i>Neoboutonia africana</i> Müll.Arg.	nkusu
<i>Pycnocomia chevalieri</i> Beille	–
<i>Ricinodendron heudelotii</i> (Baill.) Pierre ex Pax	sangala
<i>Uapaca guineensis</i> Müll.Arg.	imusangi
<i>Uapaca</i> sp.	kusa/kosa
Flacourtiaceae	
<i>Coloncoba glauca</i> (P. Beauv.) Gilg	isanza
<i>Coloncoba welwitschii</i> (Oliv.) Gilg	ichoko
<i>Lindackeria dentata</i> (Oliv.) Gilg	itokome
Guttiferae (Clusiaceae)	
<i>Allanblackia floribunda</i> Oliv.	Ibomo
<i>Garcinia kola</i> Heckel	Onyala
<i>Harungana madagascariensis</i> (Lam. ex Poir.) Choisy	Musasa
<i>Mammea africana</i> Sabine	Malombo
<i>Symphonia globulifera</i> L. f.	Minguengue

APPENDIX. *Continued.*

Species	Vernacular name (Punu)
Hyppocrateaceae (Celastraceae)	
<i>Loeseneriella apiculata</i> (Welw. ex Oliv.) R. Wilzc.	Ipope/tongo
<i>Salacia erecta</i> (G. Don) Walpère	Ibolo
Icacinaceae	
<i>Chlamydocarya thomsoniana</i> Baill.	—
Irvingiaceae	
<i>Irvingia gabonensis</i> (Aubry-Lecomte ex O'Rorke) Baill.	ipayo
<i>Irvingia grandiflora</i> (Engl.) Engl.	manga
<i>Irvingia robur</i> Mildbr.	bilembo
<i>Irvingia smithii</i> Hook. f.	mutesi
<i>Klainedoxa gabonensis</i> Pierre ex Engl.	—
Lamiaceae (Labiatae)	
<i>Solenostemon monostachyus</i> (P. Beauv.)	murinda
Lecythidaceae	
<i>Petersianthus macrocarpus</i> (P. Beauv.) Liben	—
Leeaceae	
<i>Leea guineensis</i> G. Don	iboso
Linaceae	
<i>Hugonia</i> sp.	ibeye
Loganiaceae	
<i>Anthocleista liebrechtsiana</i> De Wild. & T. Dur.	—
<i>Anthocleista vogelii</i> Planch.	—
<i>Mostuea brunonis</i> Didr. var. <i>brunonis</i>	sabu
<i>Mostuea hirsuta</i> (T. Anders. ex Benth. & Hook. f.) Baill. ex Bak.	—
<i>Strychnos aculeata</i> Solerød	ikenge
<i>Strychnos camptoneura</i> Gilg & Busse	bundu
<i>Strychnos usambarensis</i> Gilg	ibundu
<i>Strychnos</i> sp.	—
Loranthaceae	
<i>Phragmanthera capitata</i> (Sprengue) S. Balle	—
<i>Phragmanthera</i> sp.	—
<i>Tapinanthus brunneus</i> (Engl.) Danser.	ieteke
Malvaceae	
<i>Hibiscus surattensis</i> L.	sisangala
<i>Sida acuta</i> Burm. f.	—
<i>Urena lobata</i> L.	lubote
Melastomataceae	
<i>Dichaetanthera strigosa</i> (Cogn.) Jacq.-Fél.	—
<i>Dinophora spennoroides</i> Benth.	—
<i>Dissotis brazzae</i> Cogn.	igama
<i>Dissotis hensii</i> Cogn.	igama
<i>Heterosis rotundifolia</i> (Sw.) Jacq.-Fél.	igama
<i>Warneckea membranifolia</i> (H. K. F.) Jacq.-Fél.	inionio

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APPENDIX. *Continued.*

Species	Vernacular name (Punu)
Meliaceae	
<i>Carapa procera</i> DC.	mutiama
<i>Entandrophragma angolense</i> (Welw.) C. DC.	tiama
<i>Entandrophragma candollei</i> Harms	sipo
<i>Entandrophragma cylindricum</i> (Sprague) Sprague	kossipo
<i>Entandrophragma palustre</i> Staner	mucajou
<i>Entandrophragma utile</i> (Dawe & Sprague) Sprague	sapeli
<i>Trichilia heudelotii</i> Planch. ex Oliv.	itoko
<i>Trichilia retusa</i> Oliv.	kitoko
<i>Turrea cabraea</i> De Wild. & T. Dur.	ibita
<i>Turreanthus africanus</i> (Welw. ex C. DC.) Pellegr.	samba
Menispermaceae	
<i>Cissampelos owariensis</i> P. Beauv.	—
<i>Dioscoreophyllum cumminsii</i> (Stapf) Diels var. <i>cumminsii</i> Troupin	mbi
<i>Limaciopsis loangensis</i> Engl.	pangu
<i>Tiliacora laurentii</i> De Wild. var. <i>bequaertii</i> (De Wild.) Troupin	dombo
<i>Triclisia dictyophylla</i> Diels	—
<i>Triclisia louisii</i> Troupin	mobangui
<i>Triclisia patens</i> Oliv.	molombi
<i>Triclisia</i> sp.	—
Mimosaceae	
<i>Acacia pennata</i> (L.) De Wild.	bala
<i>Albizia ferruginea</i> (Guill. & Perr.) Benth.	imanba
<i>Albizia zygia</i> (DC.) J. F. Macbr.	ibamba
<i>Pentaclethra eetveldeana</i> De Wild. & T. Dur.	dibakala
<i>Pentaclethra macrophylla</i> Benth.	mukassa
<i>Piptadeniastrum africanum</i> (Hook. f.) Bren.	mussinga
<i>Tetrapleura tetraptera</i> (Schum. & Thonn.) Taubert	mucha
Moraceae	
<i>Artocarpus communis</i> Forst.	tuti
<i>Bosqueia angolensis</i> Ficalho	nitu
<i>Bosqueiopsis gillettii</i> De Wild. & Dur.	buanga
<i>Ficus asperifolia</i> Miq.	ndimbou
<i>Ficus barteri</i> Sprague	mbumbe
<i>Ficus elasticoides</i> De Wild.	mbumbe
<i>Ficus exasperata</i> Vahl	—
<i>Ficus gnaphalocarpa</i> (Steud. ex Miq.) A. Rich.	—
<i>Ficus natalensis</i> Hochts.	—
<i>Ficus recurvata</i> De Wild.	itoko
<i>Ficus thonningii</i> Blume	—
<i>Ficus wildemaniana</i> Warb. ex De Wild. & T. Dur.	—
<i>Ficus</i> sp.	lisanga
<i>Milicia excelsa</i> (Welw.) C. C. Ber	kambala
<i>Treculia africana</i> Decne	ipoti
<i>Trilepisium madagascariense</i> DC.	pingui

APPENDIX. *Continued.*

Species	Vernacular name (Punu)
Myristicaceae	
<i>Coelocaryon botryoides</i> Verm.	mulomba
<i>Pycnanthus angolensis</i> (Welw.) Warb.	ilomba
<i>Pycnanthus marchalianus</i> Ghesq.	lomba
<i>Staudtia kamerunensis</i> Warb.	niove
Nymphaeaceae	
<i>Nymphaea heudelotii</i> Planch.	iba
Ochnaceae	
<i>Campylospermum claessensii</i> (De Wild.) Farron	phaso
<i>Campylospermum elongatum</i> (Oliv.) Van Tiegh.	ipaso
<i>Ochna gilletana</i> Gilg	kukuluba
<i>Lophira alata</i> Banks ex Gaertn.	ikole
<i>Rhabdophyllum arnoldianum</i> (De Wild. & T. Dur.) Van Tiegh.	–
<i>Rhabdophyllum welwitschi</i> Van Tiegh.	–
Olacaceae	
<i>Aptandra zenkeri</i> Engl.	–
<i>Heistera parvifolia</i> Smith	–
<i>Olax gambecola</i> Baill.	itsotso
<i>Ongokea gore</i> (Hua) Pierre	obiema
<i>Strombosia grandifolia</i> Hook. f.	mungueke
<i>Strombosia pustulata</i> Oliv.	mukari
<i>Strombosiopsis tetrandra</i> Engl.	itali
Oleaceae	
<i>Schrebera golungensis</i> A. Chev.	ivere
Onagraceae	
<i>Ludwigia abyssinica</i> A. Rich.	–
<i>Ludwigia adscendens</i> (L.) Hara	–
Oxalidaceae	
<i>Biophytum abyssinicum</i> Steud. ex A. Rich.	kunta
<i>Oxalis corniculata</i> L.	lupeto
Pandaceae	
<i>Microdesmis puberula</i> Hook. f.	dikota
<i>Panda oleosa</i> Pierre	okana
Papilionaceae (Fabaceae)	
<i>Abrus precatorius</i> L.	mungumba
<i>Angylocalyx pyraertii</i> De Wild.	likubi
<i>Baphia densiflora</i> Harms	ibolo
<i>Dalbergia hostilis</i> Benth.	–
<i>Dalbergia saxatilis</i> Hook. f.	bedeke
<i>Dalhousiea africana</i> S. Moore	–
<i>Leptoderris hypargyrea</i> Harms	ibinde
<i>Leptoderris</i> sp. 1	ibinde
<i>Leptoderris</i> sp. 2	ibinde
<i>Millettia laurentii</i> De Wild.	mutoko

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APPENDIX. *Continued.*

Species	Vernacular name (Punu)
<i>Millettia sanagana</i> Harms	ganda
<i>Millettia versicolor</i> Welw. ex Bak.	butali
<i>Pterocarpus soyauxii</i> Taubert	padouk
<i>Tephrosia vogelii</i> Hook. f.	mbali
Passifloraceae	
<i>Barteria fistulosa</i> Mast.	mufifi
<i>Barteria nigritiana</i> Hook. f.	ibambo
<i>Passiflora foetida</i> L.	—
Phytolacaceae	
<i>Phytolacea dodecandra</i> L'Hérit.	tili
Piperaceae	
<i>Piper guineense</i> Schum. & Thonn.	pili-pili
<i>Piper umbellatum</i> L.	itchefo
Polygonaceae	
<i>Carpolobia alba</i> G. Don	—
Portulacaceae	
<i>Portulaca oleracea</i> L.	muido
<i>Talinum triangulare</i> (Jacq.) De Willd.	—
Rhamnaceae	
<i>Lasiodiscus marmoratus</i> C. H. Whight	—
<i>Maesopsis eminii</i> Engl.	—
Rubiaceae	
<i>Aidia micrantha</i> (K. Schum.) F. White var. <i>micrantha</i>	ikeni
<i>Brenania brieyi</i> (De Wild.) E. Petit	monjo
<i>Canthium arnoldianum</i> (De Wild. & T. Dur.) Hepper	mugasa
<i>Canthium multiflorum</i> Hiern	kouaku
<i>Coffea robusta</i> Linden	cafi
<i>Corynanthe mayumbensis</i> (Good) N. Hallé	ikangue
<i>Diodia scandens</i> Swartz	—
<i>Geophila involucrata</i> Hiern	—
<i>Leptactina pynaertii</i> De Wild.	ibedi
<i>Massularia acuminata</i> (G. Don) Bullock ex Hoyle	muidi
<i>Mitragyna ciliata</i> Aubr. & Pellegr.	itobo
<i>Mitragyna stipulosa</i> (DC.) O. Kuntze	itobo
<i>Morinda morindoides</i> (Bak.) Milne-Redh.	—
<i>Mussaenda chippii</i> Wernh.	—
<i>Mussaenda erythrophylla</i> Schum. & Thonn.	—
<i>Nauclea diderrichii</i> (De Wild. & Th. Dur.) Merrill	bilinga
<i>Nauclea pobeguini</i> (Pobeguini ex Pellegr.) Petit	bilinga
<i>Nauclea vanderghuchtii</i> (De Wild.) Petit	—
<i>Oxyanthus speciosus</i> DC.	igondo
<i>Pauridiantha dewevrei</i> (De Wild. & Th. Dur.) Bremek.	wassasa
<i>Pausinystalia johimbe</i> (K. Schum.) Pierre ex Beille	—
<i>Porterandia cladantha</i> (K. Schum.) Keay	kikoko
<i>Rothmannia hispida</i> (K. Schum.) Fager	—

APPENDIX. Continued.

Species	Vernacular name (Punu)
<i>Rothmannia talbotii</i> (Wernh.) Keay	–
<i>Stipularia africana</i> G. Don	–
Rutaceae	
<i>Zanthoxylum heitzii</i> (Aubr. & Pellegr.) Waterman	ibolongo
<i>Zanthoxylum macrophylla</i> Oliv.	ibolongo
Sapindaceae	
<i>Allophylus africanus</i> P. Beauv.	mapoto
<i>Blighia welwitschii</i> (Hiern) Radlk.	mosongo
<i>Chytranthus atroviolaceus</i> Bak. f. ex Hutch. & Dalziel	mboli/toli
<i>Chytranthus mortehanii</i> (De Wild.) De Voldere ex Hauman	toko
<i>Chytranthus talbotii</i> (Bak. f.) Keay	tokoli
<i>Laccodiscus ferrugineus</i> Radlk.	ngoyo
<i>Pancovia floribunda</i> Pellegr.	iviodo
<i>Pancovia harmsiana</i> Gilg	viodo
<i>Pancovia laurentii</i> (De Wild.) Gilg ex De Wild.	iviodo
<i>Pancovia pedicellaris</i> Radlk. & Engl.	iviodo
<i>Pancovia</i> sp.	–
<i>Paullinia pinnata</i> L.	bino
Sapotaceae	
<i>Autranella congolensis</i> (De Wild.) A. Chev.	sassa
<i>Baillonella toxisperma</i> Pierre	muabi
<i>Gambeya africana</i> (G. Don) Pierre	longui
<i>Gambeya boukokoensis</i> Aubr. & Pellegr.	longui
<i>Gambeya larcoutiana</i> (Milbr.) Aubr. & Pellegr.	longui
<i>Gambeya perpulchra</i> (Milbr.) Aubr. & Pellegr.	longui
<i>Manilkara fouilloyana</i> Aubr. & Pellegr.	dibala
<i>Manilkara letouzeyi</i> Aubr.	dibala
<i>Omphalocarpum elatum</i> Miers	bolo
<i>Tridesmostemon omphalocarpiodes</i> Engl.	dukaga
<i>Synsepalum dulcificum</i> (Schum.) Baill.	meri
<i>Synsepalum longecuneatum</i> (Radlk.) Engl.	meri
Solanaceae	
<i>Solanum torvum</i> Sw.	–
Sterculiaceae	
<i>Chlamydocola lastourvillensis</i> (Bod. & Pellegr.) N. Halle	imeko
<i>Cola acuminata</i> (P. Beauv.) Schott & Engl.	likasu
<i>Cola gabonensis</i> Aubr.	kasu
<i>Cola heterophylla</i> (P. Beauv.) Schott & Engl.	dikasu
<i>Cola nitida</i> (Vent) Schott & Engl.	kasu
<i>Cola rostrata</i> K. Schum.	ikasu
<i>Eribroma oblonga</i> (Mast.) Bod. ex Hallé	–
<i>Leptonychia batangensis</i> (C. H. Wright) Burret	likaka
<i>Nesogordonia kabingaensis</i> (K. Schum.) Capuron	ibahi
<i>Pterygota bequaertii</i> De Wild.	kuko
<i>Sterculia bequaertii</i> De Wild.	–
<i>Sterculia tragacantha</i> Lindl.	ifolo

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APPENDIX. *Continued.*

Species	Vernacular name (Punu)
<i>Triplochiton scleroxylon</i> K. Schum.	tukula
Styracaceae	
<i>Afrostryax lepidiphyllus</i> Mildbr.	–
Thymelaeaceae	
<i>Dicranolepis laciniata</i> Gilg	–
Tiliaceae	
<i>Desplatsia chrysochlamys</i> (Mildbr. & Burret) Mildbr. & Burret	dira
<i>Desplastia dewevrei</i> (De Wild. & T. Dur.) Burret	obio
<i>Duboscia macrocarpa</i> Brocq.	binga
<i>Ghyphaea brevis</i> (Spreng.) Monachino	imani
<i>Grewia coriacea</i> Mast.	issaga
<i>Grewia oligoneura</i> Sprague	–
<i>Grewia seretii</i> De Wild.	issaga
<i>Triumfetta cordifolia</i> A. Rich.	ikuaku
Ulmaceae	
<i>Celtis adolfi-friderici</i> Engl.	missengue
<i>Celtis mildbraedii</i> Engl.	missengue
<i>Celtis tessmannii</i> Rendle	–
<i>Celtis zenkeri</i> Engl.	–
<i>Haloptelea grandis</i> (Hutch.) Mildbr.	lilolo
<i>Trema guineensis</i> (Schum. & Thonn.) Ficalhoa	ikuaku
Verbenaceae	
<i>Clerodendron bakeri</i> Gürke	bene
<i>Vitex doniana</i> Sweet	ibene
Violaceae	
<i>Rinorea banguensis</i> Engl.	kombe
<i>Rinorea cerasifolia</i> Brandt	kuisa
<i>Rinorea elliotii</i> Engl.	kuisa
Vitaceae (Ampelidaceae)	
<i>Cissus dinklagei</i> Gilg & Brandt	biki
MONOCOTYLEDONEAE	
Agavaceae	
<i>Dracaena arborea</i> (Wild) Link	ibuila
<i>Dracaena camerooniana</i> Bak.	ingale
<i>Dracaena humilis</i> Bak.	ingale
Amaryllidaceae	
<i>Haemanthus multiflorus</i> Martyn.	ilabua
Araceae	
<i>Anubias barteri</i> Schott var. <i>glabra</i> N.E. Brown	jamafa
<i>Anubias hastifolia</i> Engl.	jamafa
<i>Cercestis congensis</i> Engl.	balanga
<i>Culcasia scandens</i> P. Beauv.	–
<i>Cyrtosperma senegalense</i> (Schott) Engl.	–

APPENDIX. *Continued.*

Species	Vernacular name (Punu)
<i>Pistia stratiotes</i> L.	ndegue
<i>Rhektophyllum mirabile</i> N. E. Br.	biro
Arecaceae (Palmae)	
<i>Ancistrophyllum opacum</i> Drude	imbile
<i>Ancistrophyllum secundiflorum</i> Wendl.	—
<i>Borassus aethiopum</i> Mart.	—
<i>Calamus deeratus</i> Mann & Wendl.	mosenda
<i>Elaeis guineensis</i> Jacq.	liba
<i>Eremospatha cabrae</i> De Wild.	muba
<i>Eremospatha hookeri</i> (Mann & Wendl.) Wendl.	muba
<i>Eremospatha macrocarpa</i> Wendl.	liba
<i>Eremospatha wendlandiana</i> Dammer <i>ex</i> Becc.	muba
<i>Hyphaene guineensis</i> Schum. & Thonn.	yongu
<i>Phoenix reclinata</i> Jacq.	luguila
<i>Raphia hookeri</i> Mann & Wendl.	kuza
<i>Raphia vinifera</i> P. Beauv.	kuza
Commelinaceae	
<i>Aneilema beninensis</i> (P. Beauv.) Kunth	guli
<i>Commelina diffusa</i> Burn. f.	itutu
<i>Palisota ambigua</i> (P. Beauv.) C. B. Clarke	bingue
<i>Palisota hisurta</i> (Thunb.) K. Schum.	bingue
<i>Palisota thollonii</i> Hua	—
Costaceae	
<i>Costus afer</i> Kerl-Gawl.	isani
<i>Costus lucanusianus</i> J. Braun & K. Schum.	isani
Cyperaceae	ipoholi
<i>Bulbostylis laniceps</i> C. B. Clarke	ipoholi
<i>Bulbostylis pilosa</i> (De Wild.) Cherm.	ipopo
<i>Cyperus articulatus</i> L.	ipopo
<i>Cyperus haspan</i> L.	luandu
<i>Cyperus mapanioides</i> C. B. Clarke	luandu
<i>Cyperus polystrachyos</i> Roettb.	itefe
<i>Cyperus rotundus</i> L.	luandu
<i>Cyperus tenax</i> Boeck	bieneffe
<i>Hypolytrum poecilopis</i> Nemes	buanga
<i>Hypolytrum purpurascens</i> Cherm.	ibuanga
<i>Kyllinga erecta</i> Schum.	buka
<i>Pycnus subtrigonus</i> C. B. Clarke	viodo
<i>Rhynchospora corymbosa</i> (L.) Britt.	buka
<i>Rhynchospora rugosa</i> (Valh.) Gale	ilengo
<i>Scleria boivinii</i> Steud.	ilengo
<i>Scleria racemosa</i> Poir.	
Dioscoreaceae	bobujo
<i>Dioscorea bulbifera</i> L.	mbala
<i>Dioscorea mangenotiana</i> J. Miège	imbala
<i>Dioscorea sagittifolia</i> Pax var. <i>lecardii</i> (De Wild.) Nkounkou	

(cont.)

APPENDIX. *Continued.*

Species	Vernacular name (Punu)
Hydrocharitaceae	kongo issika
<i>Hydrocharis</i> sp.	
Marantaceae	makaya
<i>Ataenida conferta</i> (Benth.) Mill.	makaya
<i>Halopegia azurea</i> (K. Schum.) K. Schum.	punula
<i>Haumania danckelmaniana</i> (J. Braun & K. Schum.) Milne-Redh.	bambamgu
<i>Hypselodelphys poggeana</i> (K. Schum.) Milne-Redh.	bambamgu
<i>Hypselodelphys violacea</i> (K. Schum.) Milne-Redh.	makaya
<i>Marantochloa congensis</i> (K. Schum.) Léon. & Mullend.	tchycaya
<i>Marantochloa filipes</i> (Benth.) Hutch.	tchycaya
<i>Marantochloa leucantha</i> (K. Schum.) Milne-Redh.	ensasa
<i>Megaphrynium macrostachyum</i> (Benth.) Milne-Redh.	ensas
<i>Sarcophrynium priogonium</i> (K. Schum.) K. Schum.	bandu
<i>Sarcophrynium schweinfurtianum</i> (O'Ktze) Milne-Redh.	issengue
<i>Trachyprynium braunianum</i> (K. Schum.) Bak.	
Orchidaceae	iteke
<i>Angraecum distichum</i> Lindl.	iteke
<i>Bulbophyllum barbigerum</i> Lindl.	
Pandanaceae	uya
<i>Pandanus candelabrum</i> P. Beauv.	
Poaceae (Gramineae)	buloita
<i>Acroceras ampectans</i> Stapf	ibingui
<i>Jardinea congoensis</i> (Hack.) Franch.	—
<i>Leptaspis cochleata</i> Thwaites	—
<i>Leptaspis comorensis</i> A. Camus	—
<i>Olyra latifolia</i> L.	
Smilacaceae	zoline
<i>Smilax kraussiana</i> Meissn.	
Zingiberaceae	cibieta
<i>Aframomum citratum</i> (Pereia) K. Schum.	sani
<i>Aframomum giganteum</i> (Oliv. & Hanb.) K. Schum.	luvualu
<i>Aframomum letestuanum</i> Gagnep.	isani
<i>Aframomum sanguineum</i> (K. Schum.) K. Schum.	isani
<i>Renealmia polypus</i> Gagnep.	—