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Rarity and abundance in a diverse African forest

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Abstract We censused all trees ≥1 cm dbh in 50 ha of forest in Korup National Park, southwest Cameroon, in the central African coastal forest known for high diversity and endemism. The plot included 329,519 individuals and 493 species, but 128 of those taxa remain partially identified. Abundance varied over four orders of magnitude, from 1 individual per 50 ha (34 species) to *Phyllobotryon spathulatum*, with 26,741 trees; basal area varied over six orders of magnitude. Abundance patterns, both the percentage of rare species and the dominance of abundant species were similar to those from 50-ha plots censused the same way in Asia and Latin America. Rare species in the Korup plot were much less likely to be identified than common species: 42% of taxa with <10 individuals in the plot were identified to species, compared to 95% of the abundant taxa. Geographic ranges for all identified species were gleaned from the literature and online flora. Thirteen of the plot species are known only from Korup National Park (all discovered during the plot census), and 39 are restricted to the Nigeria–Cameroon coastal zone. Contrary to expectation, species with narrow geographic ranges were more abundant in the plot than average. The small number of narrow endemics (11% of the species), many locally abundant, mitigates short-term extinction risk, either from demographic stochasticity or habitat loss.

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Introduction

Rarity is central to tropical forest conservation. Diverse communities inevitably include large numbers of species which are seldom recorded: the singletons in many inventories. In typical forest plots of a single hectare or less, 30% of the tree species may be singletons (Pitman et al. 1999). To exacerbate the difficulties with our understanding of tropical communities, species identification is often problematic. Even experts leave many specimens as 'morphospecies'—recognizable within a site, but not matched to named collections in herbaria. For these reasons—rarity and difficult taxonomy—quantitative information on the abundances and distributions of tropical organisms, not just trees, remains problematic, and conservation planning is hindered by lack of basic knowledge about which species are most endangered. This is probably true in Africa more than any other region.

In addition, African forests can have unusual abundance patterns. One or a few species sometimes approach abundances observed in temperate forests (e.g. Sankovski and Pridnia 1995; Shaw et al. 2004), where a single dominant tree comprises more than half the forest (Makana 1998; Hart unpublished, 1990). This is known as monodominance, and although it is known in tropical forests elsewhere, it is most important in Africa (Marimon et al. 2001; Nascimento and Proctor 1997). Monodominance should go hand-in-hand with low diversity (Connell and Lowman 1989) and rarity, because the dominant trees force the scarce species to even lower abundance. Enhanced rarity exacerbates the problems of studying the forests. More exhaustive inventories are needed to document tree species abundances, and rarity might enhance extinction risk for many species.

The coastal forests of Western Africa, especially Cameroon, are increasingly recognized as important for the conservation of forest diversity. They are the richest in plant species across Africa and repeatedly appear as a center of endemism for plants and for animals (Lovett et al. 2000; Linder 2001; Küper et al. 2004; Rodrigues et al. 2004; Burgess et al. 2005). Because conservation of species and communities depends on more than just species counts, we sought more detailed information about the forests of coastal Cameroon. As part of a global network of large census plots within the tropics, coordinated by the Center for Tropical Forest Sciences (CTFS) of the Smithsonian Institution, we initiated a large-scale and precise forest inventory, aimed at documenting the abundances of all tree species and testing hypotheses about factors that regulate diversity and species composition. The plot covers 50 ha in the Korup National Park, and all individual trees have been mapped and identified (Thomas et al. 2003; Chuyong et al. 2004). Along with a companion plot in the Democratic Republic of the Congo (Makana et al. 2004), these are the largest forest plot inventories in Africa, and provide quantitative assessments of abundance and rarity.

Here we describe the floristic composition, structure, and physiognomy of the Korup plot. We answer several basic questions about tree abundance: is the forest monodominant, and how abundant are the dominant canopy tree species? Is the understory also dominated by one or a few species? At the opposite extreme, how

many species are rare in 50 ha? We then consider whether the rare species at Korup have narrow geographic ranges, as predicted by macroecological theory (Brown 1995; Gaston 2003). Conservation planning often relies on the local abundance of species as well as their geographic ranges, and here we provide information for judging the conservation importance of southwest Cameroon (Rodrigues and Gaston 2000). Because a dozen other sites in the world now have comparable inventories (Condit et al. 2005), abundance patterns at Korup can be compared against the rest of the world, so that we can determine whether African forests differ fundamentally, as Richards (1973) once suggested.

Materials and methods

The park and forest

The Korup plot (NW corner 5°03.86′ N, 8°51.17′ E) is located in southern Korup National Park (4°54′ to 5°28′ N latitude and 8°42′ to 9°16′ E longitude), near the coast of Cameroon and the Nigerian border. It is within a belt of evergreen forest extending from southeast Nigeria to the mouth of the Congo River (Fig. 1) that is called the Lower Guinea forest, containing one or more Pleistocene refugia (White 1979; Maley 1987). The belt is characterized by wet forested lowlands, often backed by mountain ranges, and is generally reported to be rich in species (Linder 2001). Letouzey (1968, 1985) described the southern part of the Korup National Park as Biafran coastal forest, rich in gregarious Fabaceae-Caesalpinioideae.

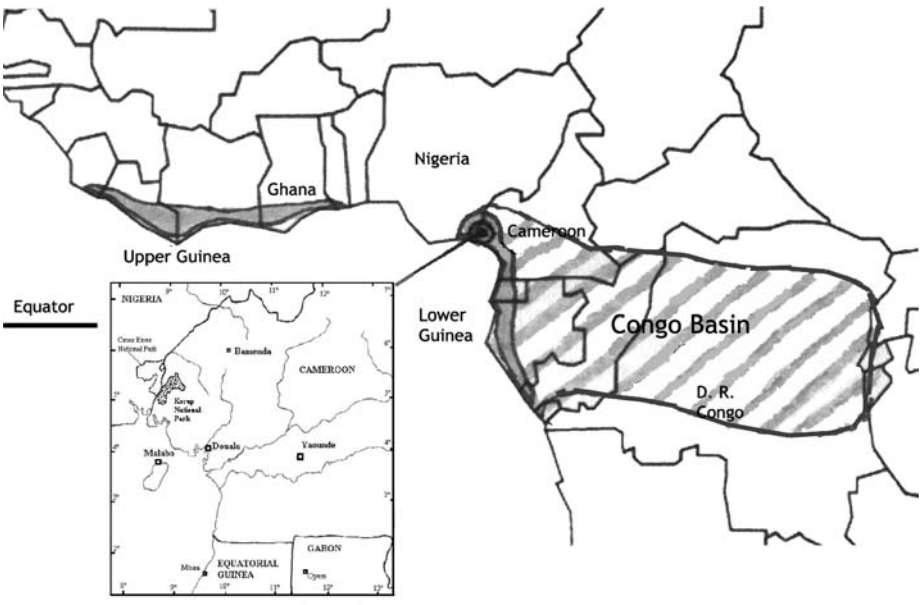

Fig. 1 Map of tropical Africa showing the three major forest blocks, from west to east: Upper Guinea, Lower Guinea, Congo (or Congolian). Inset in lower left is the detailed map of southeast Nigeria and southwest Cameroon, with Korup National Park indicated

The plot measures 1,000×5,00 m^2 and is 150–240 m above sea level. The long axis of the plot crosses a permanent creek which is fed by a number of small, seasonal drainages (Fig. 2). One-third of the plot is a steep, rocky ridge, while the remaining two-thirds are flat terrain (Fig. 2). Soils of southern Korup are mostly non-hydric, skeletal, with a high sand content and low pH (Gartlan et al. 1986). Detailed soil mapping within the plot has been initiated but will be reported elsewhere.

Census

We first surveyed the 50 ha, placing permanent stakes precisely every 20 m with minimal damage to the vegetation (Condit 1998). Subsequently, all individuals ≥1 cm diameter-breast-height (dbh) were tagged with numbered aluminum tags, mapped, measured, and identified to morphospecies. Stem diameter was measured 1.3 m above the ground, with swollen or buttressed trees measured at a spot where the trunk was more regular; in these cases, the measurement spot was painted so future measurements could match. Any stem fork or branch <1.3 m above the ground was treated as a secondary stem and also measured. To map stems, ropes were strung between adjacent stakes (including diagonals) and temporary stakes were placed at 5-m intervals, then the position of each stem was marked by eye on maps covering 10×10 m^2. Additional details are given in Condit (1998).

Taxonomy and collection

Most of the trees enumerated lacked flowers and fruits, so we had to rely on vegetative characters to segregate morphospecies: color, odor, and texture of bark slash; color of exudates from bark or leaves; leaf arrangement; petiole length; leaf shape; the number and form of secondary veins; and indumenta. Vouchers were collected from each morphospecies in the plot when first encountered. The first specimen was considered the ''type'' and was carefully described. Each morphospecies was subsequently collected at least five times (excepting those with <5 individuals) and compared side-by-side with the ''type'' until we were confident we could recognize

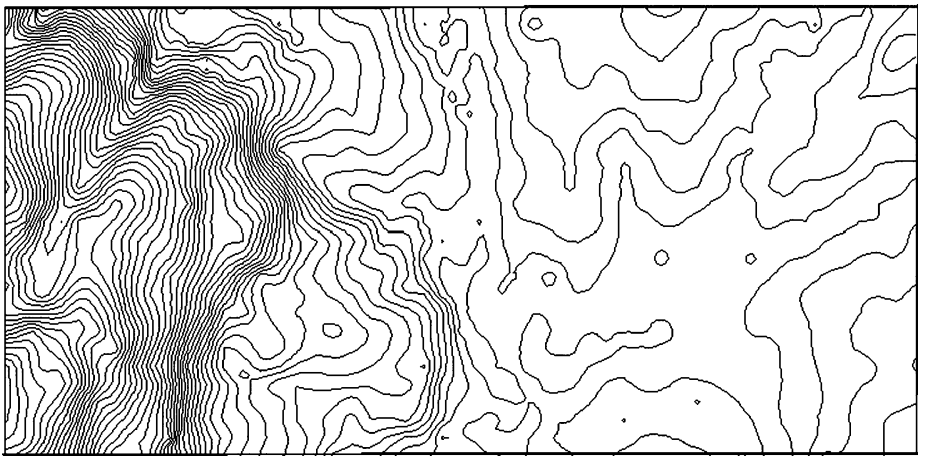

Fig. 2 Topographic map of the Korup 50-ha plot, 1000 m × 500 m with 2 m contours. North and the highest point in the plot is to the left

it. Flowers or fruits were eventually collected from most taxa. Matching and recognizing morphospecies is a matter of judgment, and our opinions changed through time, but two of us (DK, DT) spent 700 days over 3 years in the plot, viewed nearly every one of 330,000 individuals, and checked all morphospecies against reference collections at herbaria in Cameroon, the U.K., and the U.S. (Herbaria YA, SCA, K, MO) and against regional floras (Aubréville et al. 1963–2001, 1961–1991; Hutchinson et al. 1954–1972). We are reasonably confident in our current classification of individuals into 493 morphospecies, but a few will change when fertile material is studied. A few trees could not be sorted, mostly because they lacked leaves but appeared to be alive. Our family classification follows the Angiosperm Phylogeny Group (2003).

Abundance and diversity calculations

Because many inventories in tropical forest cover just 1 ha, we report abundance and basal area on a per hectare basis as well as for all 50 ha combined. The former is simply 0.02 times the latter, however, we can go further by estimating standard deviations by dividing the 1000×500 m^2 into 50 non-overlapping 100 × 100 m^2 and counting individuals (basal area) in each. Our counts of individuals do not include multiple stems per tree, but multiple stems are included in the basal area calculations. Unidentified trees were included in calculations of total plot basal area and density.

For species richness of trees ≥1 cm dbh, we report the tally for all 50 ha and the mean per hectare, obtained by averaging the totals from 50 100×100-m^2. The trees not identified to morphospecies were not included in diversity estimates. All calculations were repeated for trees ≥10 cm dbh.

Height categories of species

We classified all species into four growth-forms according to their estimated maximum height. Treelets and small trees include all species with adults generally less than 10 m tall; understory trees are those with adults 10–20 m tall; lower canopy species have heights 20–30 m; and upper canopy species are those often >30 m in height and emergent above the main canopy. Corresponding adult stem diameters were <10 cm, 10–30 cm, 30–60 cm, and >60 cm dbh, respectively. Information on the heights of the species came from field estimates in the plot supplemented with information from the literature, especially Aubréville et al. (1963–2001) and Hutchinson et al. (1954–72).

Geographic range

Distribution patterns of the Korup tree species were tallied relative to the major African phytochoria (White 1979, 1983), which are based on the three main blocks of moist tropical forest in Africa (Fig. 1). White's large eastern block, or *Congolian* forest, falls largely in the two countries called Congo. His central block is the *Lower Guinean* forest, and covers the coastal belt from eastern Nigeria south through Gabon. The western block is *Upper Guinea*, mostly in Ivory Coast and Ghana. These three blocks are considered Pleistocene forest refugia (White 1983; Maley 1987), and Upper Guinea in the west is currently isolated from Lower Guinea by the Dahomey

Gap, a low rainfall area where savanna reaches the Atlantic coast; Lower Guinea and the Congolian forest are presently contiguous.

Tree distributions were obtained from the literature (Aubréville et al. 1963–2001, 1961–1991; Hutchinson et al. 1954–1972), supplemented by the TROPICOS database (http://www.mobot.mobot.org/W3T/Search/vast.html). Ideally, we would have considered ranges quantitatively, but species distribution data from tropical Africa is too sparse to allow this. Instead, we assigned each species to one of seven categories: (1) pan-African, including all moist forest and extending into dry and montane forests around it; (2) Guineo–Congolian, including all three moist forest blocks; (3) Lower Guineo–Congolian, meaning the central and eastern blocks; (4) Upper and Lower Guinea, or the central and western blocks; (5) Lower Guinea only; (6) coastal Nigeria–Cameroon only; and (7) Korup National Park only. The only species in the last category are those we discovered in the 50-ha plot.

We tested the hypothesis that geographic range was associated with abundance within the 50-ha plot, and this required estimates of statistical confidence. For all species in the same category of geographic range, we calculated the median abundance per 50 ha. Confidence limits in those medians were estimated by a spatial form of bootstrapping, because highly aggregated species distributions do not justify standard statistics (Valencia et al. 2004). The plot was divided into 50 individual hectares (non-overlapping 100×100 m^2), and these were resampled with replacement 1,000 times. For each sample, the median abundances were recalculated, and the 2.5th and 97.5th percentiles were used as confidence limits.

Results

Floristics and diversity

A total of 493 morphospecies were recorded within the 50-ha plot, including 365 (71%) identified to species, 96 (20%) identified to genus, 29 (6%) identified to family, plus three not yet known at even the family level (Table 1). In addition, 680 individual trees have not been assigned a morphospecies. There were 245 genera and 62 families among the 493 species (Appendices 1–3). Among trees ≥10 cm dbh, there were 306 species, 184 genera, and 53 families (Table 1).

So far, we have discovered 13 new species in the plot, and four of these have been described (Kenfack et al. 2004, 2006; Sonké et al. 2002; Gereau and Kenfack 2000). We anticipate more novel species among the 128 unnamed morphospecies and the 680 unassigned individuals.

The family Rubiaceae was the richest in the plot, with 86 species in 40 genera; Fabaceae was next with 39 species in 25 genera. The traditional Euphorbiaceae had 37 species and 25 genera, but APG II (2003) divided this into the Phyllanthaceae (9 genera), the Euphorbiaceae (14 genera), and the Putranjivaceae (2 genera). The Annonaceae and Malvaceae (including the traditional Sterculiaceae and Tiliaceae) also had more than 20 species each in the plot, and the Annonaceae had 11 genera (Appendix 3).

There were 233.1 species per ha among all individuals (Table 1), and 88.5 among trees ≥10 cm dbh. Fisher's alpha for the entire plot was 56.9, and 62.8 for trees ≥10 cm dbh, but was lower for individual hectares (Table 1).

Table 1 Structure and diversity of the Korup 50-ha plot. *N* refers to the total number of, and *BA* the basal area. SD = standard deviation

	≥1 cm	≥10 cm	≥30 cm
Mean *N* ha^{-1}	6586.4	491.8	83.9
SD *N* ha^{-1}	987.6	49.7	14.9
Mean *BA* ha^{-1}	32.0	26.0	16.1
SD *BA* ha^{-1}	4.1	4.0	4.1
Mean species ha^{-1}	238	86.3	35.5
SD species ha^{-1}	17.5	12.0	8.2
Species (50 ha)$^{-1}$	493	306	192
Mean Fisher's ha^{-1}	48.3	30.5	24.2
SD Fisher's ha^{-1}	3.8	5.6	8.9
Fisher's (50 ha)$^{-1}$	56.9	49.3	41.5

Abundance

We recorded 329,319 trees with dbh ≥1 cm within the 50-ha plot, of which 24,591, or 7.5%, were ≥10 cm dbh; this amounts to 6,586 individuals ha^{-1}, with 492 ha^{-1} above 10 cm dbh. The plot had 32.0 m^2 ha^{-1} basal area, and 26.0 m^2 ha^{-1} in trees ≥10 cm.

Cola in the Malvaceae was the most abundant genus (Appendix 2), followed by *Rinorea* (Violaceae), *Phyllobotryon* (Salicaceae, formerly Flacourtiaceae), and *Diospyros* (Ebenaceae). The Malvaceae was the most abundant family, followed by Violaceae, Salicaceae, and the Euphorbiaceae (Appendix 3). *Oubanguia* was the dominant genus in basal area, almost entirely in one species, *Oubanguia alata* (Lecythidaceae, formerly Scytopetalaceae). Lecythidaceae was the dominant family in basal area, due mostly to *Oubanguia alata*, followed by Fabaceae, Malvaceae and Euphorbiaceae (Table 2).

Several treelets were the most abundant species in the plot, with *Phyllobotryon spathulatum* first and three other *Cola* close behind (Table 2). Two canopy species, *Oubanguia alata* and *Dichostemma glaucescens* (Euphorbiaceae) were also among the top 10 species in abundance. *Oubanguia* and *Dichostemma* ranked first and third in total basal area, and *Cola laterita* ranked second, with low stem density but many large trees (Table 2). The largest diameters overall were mostly *Lecomtedoxa klaineana* (Sapotaceae), reaching 190 cm and including 13 of the 20 biggest trees; the single biggest tree was a 205-cm *Erythrophleum ivorense* (Fabaceae).

At the other extreme, 221 of 493 species (45%) had a mean density of ≤1 tree ha^{-1}, and 34 species were singletons in 50 ha. Considering only trees ≥10 cm dbh, there were 38 singletons in the 50 ha, and 239 species had density <1 ha^{-1} (78% of all species ≥10 cm).

Basal area had an even greater range: 12 rare species had 2×10^{-6} m^2 ha^{-1} (a single 1-cm sapling in 50 ha), while *Oubanguia* had 4.3 m^2 ha^{-1}. The distribution of basal area and abundance per species approached log-normal, though deviating slightly with an excess of rarity (Fig. 3). These highly skewed abundance distributions produce extremes in the way that a few species dominate: the 10 most abundant species (2% of the total) accounted for 42% of the individuals, while the 10 rarest species accounted for <0.1%. In basal area, the 10 dominants accounted for 41% of the forest, while the 10 rarest accounted for 0.0001%.

Species rare in the plot were considerably less likely to be fully identified than abundant species. Of the 100 rarest species (≤7 individuals), 47 were identified to species, in contrast to 89 fully identified out of the 100 most common species (>500

Table 2 Dominant species in Korup 50-ha plot, in four diameter categories (≥10, ≥100, and ≥300 mm dbh), and in total basal area

Species	$N \geq 10$ (rank)	$N \geq 100$ (rank)	$N \geq 300$ (rank)	*BA* (rank)
Phyllobotryon spathulatum (TL) (Lower Guinea)	534.6 (1)	0.1 (215)	0.0 (315)	0.2457 (32)
Cola semecarpophylla (TL) (SE Nigeria and SW Cameroon)	490.4 (2)	0.4 (121.5)	0.0 (315)	0.6660 (7)
Dichostemma glaucescens (C) (Lower Guinea–Congolian)	345.0 (3)	45.5 (2)	1.9 (7)	1.5761 (3)
Cola praeacuta (TL) (SE Nigeria and SW Cameroon)	309.4 (4)	9.1 (14)	0.0 (315)	0.6971 (5)
Oubanguia alata (C) (Lower Guinea)	298.4 (5)	82.1 (1)	18.1 (1)	4.3721 (1)
Cola sp. nov.2 (TL) (Korup)	247.3 (6)	0.0 (369)	0.0 (315)	0.1378 (53)
Cola sp. nov.3 (TL) (Korup)	164.7 (7)	0.2 (163.5)	0.0 (315)	0.1189 (62)
Diospyros preussii (C) (Lower Guinea)	147.1 (8)	0.0 (369)	0.0 (315)	0.0668 (86)
Angylocalyx oligophyllus (TL) (Upper and Lower Guinea)	115.9 (9)	0.0 (369)	0.0 (315)	0.0679 (85)
Rinorea lepidobotrys (TL) (Upper and Lower Guinea)	109.8 (10)	1.9 (42)	0.0 (315)	0.1910 (40)
Diospyros iturensis (U) (Lower Guinea–Congolian)	95.9 (11)	10.2 (9)	0.0 (315)	0.2720 (27)
Strombosia pustulata (C) (Guineo–Congolian)	82.4 (15)	15.7 (7)	2.4 (5.5)	0.6881 (6)
Drypetes staudtii (U) (SE Nigeria and SW Cameroon)	82.0 (16)	21.7 (3)	0.1 (109.5)	0.5191 (11)
Hymenostegia afzelii (C) (Upper and Lower Guinea)	80.5 (17)	13.8 (8)	1.6 (8.5)	0.5540 (9)
Diospyros gabunensis (C) (Upper and Lower Guinea)	78.0 (18)	17.1 (6)	0.9 (17)	0.5522 (10)
Protomegabaria stapfiana (C) (Upper and Lower Guinea)	67.3 (24)	18.7 (4)	7.0 (2)	1.4642 (4)
Cola rostrata (U) (Lower Guinea)	65.7 (25)	18.4 (5)	0.2 (72.5)	0.5078 (12)
Soyauxia gabonensis (U) (Lower Guinea)	63.6 (28)	10.0 (10)	0.4 (46.5)	0.3345 (18)
Klaineanthus gaboniae (C) (Lower Guinea)	40.6 (39)	9.7 (12)	2.8 (4)	0.6172 (8)
Strombosiopsis tetrandra (C) (Lower Guinea-Congolian)	35.3 (42.5)	6.3 (17)	2.4 (5.5)	0.4609 (15)
Lecomtedoxa klaineana (E) (Lower Guinea)	6.1 (127)	4.2 (23)	2.9 (3)	1.9855 (2)
Hypodaphnis zenkeri (C) (Lower Guinea)	6.0 (129)	3.1 (31)	1.6 (8.5)	0.3205 (21)

N gives the total number of individuals per 50 ha ≥ 10 mm dbh, and *BA* the total basal area. Following each abundance category, the rank for that category is given in parentheses (rank 1 means the most abundant, 493 the least; in case of ties, all species involved were given the mean of the tied ranks, thus there are many ranks 344). A species is included if it was among the 10 most abundant species in any of the four categories. Examples: *Hypodaphnis zenkeri* is included because it ranked among the top 10 in abundance ≥300 mm dbh, although it ranked low in abundance ≥10 mm dbh. For each species, geographic range category and growth form (TL = treelet; U = understory; C = canopy; E = emergent) are listed

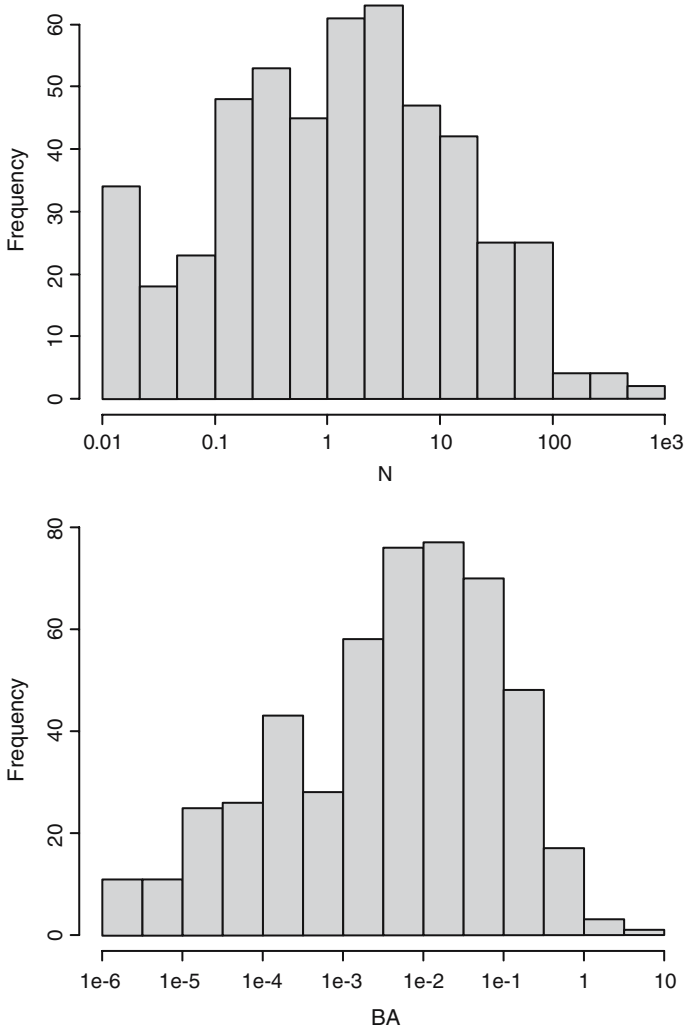

Fig. 3 Abundance distributions for the 493 species in the Korup 50-ha plot. (**A**) Stem density ha^{-1}. (**B**) Basal area ha^{-1}. Abundance axis is logarithmic

individuals). The estimated probability of identifying a species rose from 43% to 96% over the range of abundances in the plot (Fig. 4).

Rarity in single hectares

Per single hectare, there were 51.4 singletons ≥1 cm dbh, and 38.4 singletons ≥10 cm dbh (means of 50 individual hectares). These represent 22% and 44% of the total species richness ha^{-1} in the two size classes, respectively.

Geographic range and abundance

Of the species whose ranges were known, 123, or 33%, are known only from the Lower Guinean block of forest, from coastal Nigeria to Gabon (Table 3). Another

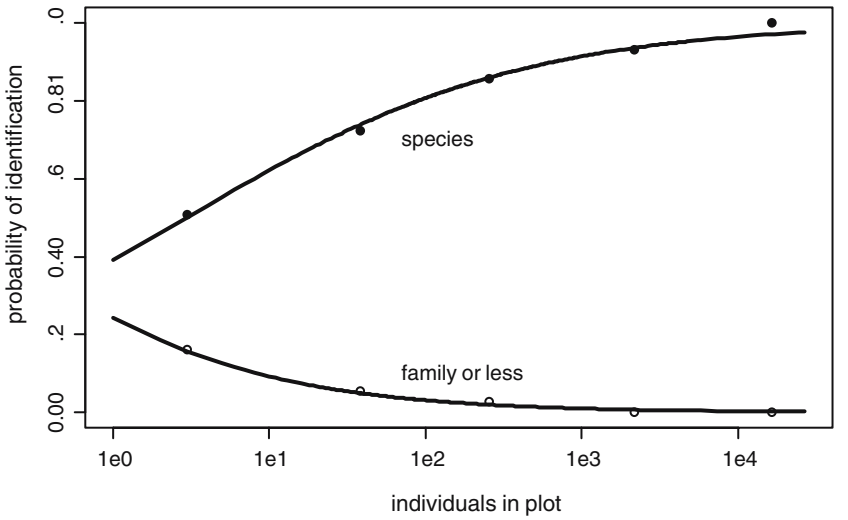

Fig. 4 Probability species are identified as a function of their abundance in 50 ha. Points are observed fraction of species in log-10 bins (1–9 individuals per 50 ha, 10–99, etc.). Curves are fitted logistic regressions based on all individual species, with binomial error. Upper curve and points give probability that morphospecies are fully identified to species; lower curve is the converse probability, not being identified to species

39 species have even narrower ranges, found only in the small area near the Cameroon–Nigeria border; this includes the 13 species discovered during the plot census, which are (for now) known only from Korup National Park. Thus, 162 species have ranges <300,000 km^2, of which 39 species span <80,000 km^2. The other 202 species have wider ranges, including 82 found in all three tropical African forests blocks.

The species with narrow geographic ranges tended to be more common in the plot than widespread species. Only the 13 new species from Korup deviated from this trend; otherwise, the species in narrower range categories had median abundances well above the plot's overall median (Table 3). Conversely, species abundant in the

Table 3 Geographic range and abundance of species found in the Korup 50-ha plot. *N* is the number of individuals ≥10 mm dbh; CI gives the bootstrap 95% confidence limits on median abundance

Range	Land area (10^3 km^2)	No. species	Abundance median *N* ha^{-1}	(CI)
Widespread in Africa	1,800	22	1.16	(0.93–1.38)
Guineo–Congolian	1,750	60	0.93	(0.77–1.16)
Lower Guinea–Congolian	1,600	44	1.67	(1.37–1.91)
Upper and Lower Guinea	300	76	1.74	(1.55–2.20)
Lower Guinea endemic	150	123	3.34	(2.90–3.96)
SE Nigeria and SW Cameroon	23	26	8.19	(5.78–9.57)
Korup	1.29	13	1.02	(0.70–1.66)
Unknown		129	0.28	(0.20–0.34)
All species		493	1.42	(1.20–1.50)

plot had narrow ranges. For example, of the 10 most abundant species, 4 are narrow endemics, all treelets in the genus *Cola*, and 3 others are known only from Lower Guinea (Table 2). The comparison of medians, though, conceals wide variation in abundance: all geographic range categories included species from rare to common (Fig. 5).

Life form

Of the 493 species in the plot, 222 were treelets, mostly <10 m tall, including many of the most abundant species in the forest. Seven of the ten dominant species in terms of stem density were treelets, four of them in the genus *Cola* (Table 2). Another 85 species in the plot were understory trees <20 m tall, seldom reaching the canopy. All told, 307 species were thus largely confined to the understory, while 112 were main canopy species and 74 were emergent trees.

Several of the treelet species have an unusual form, with a single unbranched stem bearing a terminal rosette of large leaves. The two most abundant species in the plot fall in this category (*Phyllobotryon spathulatum* and *Cola semecarpophylla*), plus several other *Cola's*, *Alexis cauliflora*, and *Crotonogynopsis* sp. nov. The rosettes form wide, shallow funnels that collect leaf litter, which decomposes in situ to form a ball of humus over the stem apex.

Discussion

We discovered in a census of half a square kilometer nearly 500 tree species, and a quarter of these remain unidentified. To date, we know that 13 of the species were

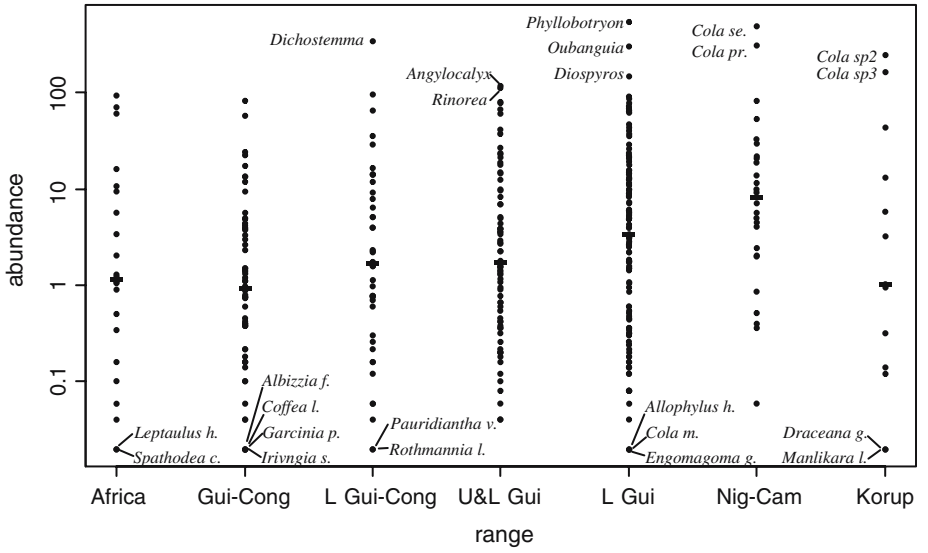

Fig. 5 Abundance of each species as a function of geographic range. The ranges are categorical, ordered from the most widespread (Africa) to the narrowest (Korup NP only); the position along the axis does not reflect range size quantitatively. Each point shows the abundance, on a log-scale, of a single species. Several of the most and least abundant species are named

previously unknown, and we expect this number to increase a lot. Most of the 128 unidentified species, though, are probably already described and many of them belong to difficult genera with many species and poorly-documented intra-specific variation. Full identification of these difficult taxa is slow, requiring the careful examination of material in several European herbaria.

Pushing the minimum diameter limit down to 1 cm, in contrast to the 10-cm limit used in most African tree inventories, uncovered a high density and diversity in the understory. Over 300 of the species in the plot typically reproduce in the forest understory, at least according to our preliminary observations on diameter distributions. Many of these did grow beyond 10 cm dbh, but 187 did not: our census would have included only 306 species had we not included the smaller trees. The understory is dominated by an odd group of litter-trapping treelets, several in the diverse African genus *Cola*.

The size of the plot also allows us to document rarity. The Korup abundance distribution has a mode well above the rarest species, nevertheless, there is a long tail of uncommon species. Abundance varied over four orders of magnitude, from singletons in 50 ha to *Phyllobotryon spathulatum*, with nearly 27,000 trees; basal area varied by six orders of magnitude, from species with single individuals of 1 cm dbh to *Oubanguia alata*, with 4 m^2 ha^{-1}. Surprisingly, though, Korup abundances are no different from other tropical forests, indeed all large plots have very similar ranges of abundance and abundance distributions (Condit et al. 2005). At Barro Colorado in Panama, 45% of 301 species had <1 tree ha^{-1}, exactly the figure at Korup, and at Pasoh in Malaysia, it was 34%. The most abundant species at Korup, including individuals above 1 cm dbh, had 535 trees ha^{-1}, compared to 808 ha^{-1} at Barro Colorado and 179 ha^{-1} at Pasoh (Condit et al. 1996a; Manokaran et al. 1992). Among trees above 10-cm dbh, though, *Oubanguia* at Korup was strikingly abundant, with 82 trees ha^{-1}, compared to *Trichilia tuberculata* (Meliaceae) in Panama, with 35 ha^{-1} and *Xerospermum noronhainum* (Sapindaceae) at Pasoh, with 11 ha^{-1}.

A parallel large inventory in monodominant forest in the Congo, however, found abundances far different from those at Korup (Makana et al. 1998, 2004; Condit et al. 2005). The dominant species above 10 cm dbh, *Gilbertiodendron dewevrei* (Fabaceae), had 180 trees ha^{-1}, and in the understory, *Scaphopetalum dewevrei* (Malvaceae) had a remarkable 3,067 ha^{-1} trees above 1 cm dbh. At the rare end, 72% of the species there had <1 tree ha^{-1}. Although *Oubanguia alata* is very abundant at Korup, the plot in Cameroon does not resemble the monodominant stand in the Congo. Stands of gregarious legumes occur elsewhere in Korup (Newbery and Gartlan 1996; Newbery et al. 2004) and these are not monodominant either. We therefore conclude that the Korup forest is not monodominant, and is more typical of mixed-species tropical forests worldwide.

If Korup is typical of other tropical forests in terms of rarity, this should not deflect from the importance of rarity: all tropical forests have many rare species and these are the species with the greatest extinction risks. Unfortunately, they are also the most difficult to identify—among those species at Korup for which we had fewer than 10 individuals to examine, most are unidentified. We are thus missing information on geographic range for most of the rare species, which can skew our conclusions about rarity and extinction risk (Ruokolainen et al. 2002).

Linder (2001) and Burgess et al. (2005) considered 'red-list' species to be those with ranges <2 square degrees of latitude, about 20,000 km^2 following the IUCN threatened list. This is approximately the area of southeast Nigeria and southwest

Cameroon that we consider an area of narrow endemism, to which 39 of the plot species are restricted.

Species abundances are also relevant to extinction risk due to demographic stochasticity, and the plot data allow us to explore this. Of the 13 species restricted to Korup National Park, 9 have ≥47 individuals, and thus have estimated populations throughout the park of several thousand trees. Overall, it does not seem likely that demographic stochasticity is a threat to plot species. What about those species so rare we missed them? Based on evidence from Panama and Malaysia (Condit et al. 1996b) and our field work around the park, we estimate that the 50-ha plot includes on the order of half the tree species occurring in the park. Some of these may have populations rare enough that extinction due to demographic fluctuations is a plausible risk; but if these unobserved species follow the patterns observed in the plot, there would still be very few species at risk. On the other hand, the 39 species restricted to 20,000 km^2 near Korup may be at some risk of extinction due to habitat loss. If most of the forest in this area were cleared, and much is already cultivated, even the abundant among these could approach extinction.

Burgess et al. (2005) found 26% of the species they analyzed had ranges below the 20,000-km^2 limit, compared to our estimate of 11% of the tree species. Our lower figure may be because trees have wider ranges than other life forms, since the Burgess analysis included a greater variety of angiosperm taxa. On the other hand, in forests around the Panama Canal, we found 1.1% of 630 tree species had highly restricted distributions, limited to the 3,000 km^2 Panama Canal watershed (Condit et al. 2001), an area about twice the size of the Korup National Park. At total of 9.6% were endemic to Panama and Costa Rica, which at 127,000 km^2 approaches the size of the Lower Guinea forest block. The Korup plot includes 162 tree species restricted to Lower Guinea, or 44% of the total, suggesting that coastal central Africa indeed has considerably narrower tree ranges than Central America.

Our knowledge of rare tropical trees remains scanty, however, they are hard to find and hard to identify. Fully documenting the flora of tropical Africa requires considerably more work—thorough field inventories at many more sites. We hazard an estimate that 10%–20% of the flora remains undiscovered, and 25%–40% remains so poorly known that geographic ranges are just crude approximations. Large and precise inventories uncover new species and reveal a window into how many remain unknown.

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Appendices

Appendix 1 Species of the Korup 50-ha plot

Genus	Species	Family	Code	*N*	*BA*	Form	Range
Afzelia	*bella*	Fabaceae	AFZI	82	5.155	Emergent	L Gui-Cong
Afzelia	*bipindensis*	Fabaceae	AFBI	3	0.7377	Emergent	L Gui-Cong
Aidia	*genipiflora*	Rubiaceae	RUBT2	33	0.2303	Understory	U&L Gui
Albizia	*ferruginea*	Fabaceae	ALFE	1	0.509	Canopy	Gui-Cong
Allexis	*cauliflora*	Violaceae	ALCA	883	1.2924	Treelet	L Gui
Allophylus	*africanus*	Sapindaceae	ALAF	3	7e-04	Treelet	Africa
Allophylus	*hirtellus*	Sapindaceae	ALLO	1	1e-04	Treelet	L Gui
Allophylus	*megaphyllus*	Sapindaceae	KLGH	122	0.0261	Treelet	Nig-Cam
Alsodeiopsis	*weissenborniana*	Icacinaceae	ERYT	16	0.0022	Treelet	L Gui
Alstonia	*boonei*	Apocynaceae	ALBO	66	14.8402	Emergent	Gui-Cong
Amphimas	*ferrugineus*	Fabaceae	SAPS	22	0.8963	Emergent	L Gui
Angylocalyx	*oligophyllus*	Fabaceae	ANTA	5801	3.3937	Treelet	U&L Gui
Angylocalyx	*pynaertii*	Fabaceae	FAB3	57	0.5717	Canopy	L Gui-Cong
Anisophyllea	*meniaudii*	Anisophylleaceae	ANME	13	0.6697	Canopy	U&L Gui
Anisophyllea	*purpurascens*	Anisophylleaceae	ANPU	52	1.5137	Canopy	L Gui
Anisophyllea	*sororia*	Anisophylleaceae	ANSO	157	2.4597	Canopy	L Gui
Annickia	*chlorantha*	Annonaceae	ENCH	707	8.3172	Canopy	L Gui-Cong
Anthocleista	*schweinfurthii*	Gentianaceae	ANSC	19	1.5124	Canopy	Gui-Cong
Anthocleista	*vogelii*	Gentianaceae	ANNO	40	2.1206	Canopy	Gui-Cong
Anthonotha	*fragrans*	Fabaceae	ANFR	247	8.8175	Emergent	U&L Gui
Anthonotha	*lamprophylla*	Fabaceae	ANLA	89	0.4126	Understory	L Gui
Anthonotha	*macrophylla*	Fabaceae	ANMA	76	1.9556	Understory	Gui-Cong
Anthonotha	sp.	Fabaceae	ANTH	7	0.8031	Emergent	.
Antidesma	*laciniatum*	Phyllanthaceae	ANTI	18	0.0804	Treelet	U&L Gui
Antidesma	*vogelianum*	Phyllanthaceae	ANVO	706	2.0852	Understory	L Gui-Cong
Antrocaryon	*micraster*	Anacardiaceae	ANTR	8	0.0091	Emergent	Gui-Cong
Aoranthe	*cladantha*	Rubiaceae	POCL	79	0.5942	Understory	L Gui-Cong
Aporrhiza	sp.	Sapindaceae	SAP5	171	0.6366	Understory	.
Araliopsis	*soyauxii*	Rutaceae	ARSO	168	3.1839	Emergent	L Gui
Asystasia	*macrophylla*	Acanthaceae	ACAN	8	0.0011	Treelet	L Gui
Aulacocalyx	*caudata*	Rubiaceae	ROT2	631	0.3988	Treelet	L Gui
Aulacocalyx	*jasminiflora*	Rubiaceae	AUCA	258	0.4781	Treelet	L Gui-Cong
Aulacocalyx	*talbotii*	Rubiaceae	AUTA	1846	2.3689	Understory	L Gui
Baikiaea	*insignis*	Fabaceae	BAIN	20	0.0588	Canopy	Gui-Cong
Baillonella	*toxisperma*	Sapotaceae	BATO	4	1.0854	Emergent	L Gui
Baphia	*capparidifolia*	Fabaceae	BAPI	1769	12.8059	Canopy	L Gui
Baphia	*laurifolia*	Fabaceae	BAP2	1069	4.3992	Canopy	U&L Gui
Baphia	sp.	Fabaceae	BAPS	51	0.2982	Understory	.
Barteria	*fistulosa*	Passifloraceae	BAFI	79	0.3336	Understory	L Gui-Cong
Beilschmiedia	*acuta*	Lauraceae	BEI4	324	0.5498	Canopy	L Gui-Cong
Beilschmiedia	*jacques-felixii*	Lauraceae	BEI3	365	0.449	Canopy	L Gui
Beilschmiedia	sp.	Lauraceae	BEIH	1	0.0665	Understory	.
Beilschmiedia	sp. 1	Lauraceae	BEI2	1352	1.7262	Treelet	.
Beilschmiedia	sp. 2	Lauraceae	BEI6	372	4.2152	Canopy	.
Beilschmiedia	sp. 3	Lauraceae	BEIP	181	0.1994	Understory	.
Beilschmiedia	sp. 4	Lauraceae	BEIS	475	2.2991	Understory	.
Belonophora	*talbotii*	Rubiaceae	BELI	1467	0.495	Treelet	Nig-Cam
Belonophora	*wernhamii*	Rubiaceae	BEWE	1081	0.2021	Treelet	Nig-Cam
Berlinia	*auriculata*	Fabaceae	BEAU	726	5.053	Canopy	U&L Gui
Berlinia	*craibiana*	Fabaceae	BECR	3	0.0607	Understory	L Gui
Berlinia	*hollandii*	Fabaceae	BEHO	101	0.8533	Emergent	Nig-Cam
Bersama	sp.	Melianthaceae	WSAP	9	0.0048	Treelet	.
Bertiera	*laxa*	Rubiaceae	BELA	54	0.0062	Treelet	L Gui

Appendix 1 continued

Genus	Species	Family	Code	*N*	*BA*	Form	Range
Bertiera	*racemosa*	Rubiaceae	RUB5	671	0.1268	Treelet	Gui-Cong
Blighia	sp.	Sapindaceae	COLL	20	0.4155	Emergent	.
Brenania	*brieyi*	Rubiaceae	OPLA	10	0.0057	Emergent	L Gui
Bridelia	*micrantha*	Phyllanthaceae	BRMI	45	0.4337	Canopy	Africa
Bridelia	sp.	Phyllanthaceae	BRID	14	0.4054	Canopy	.
Caloncoba	*glauca*	Salicaceae	CAGL	88	6.6273	Canopy	L Gui
Calpocalyx	*dinklagei*	Fabaceae	CADI	3066	7.7904	Understory	L Gui
Calycosiphonia	*spathicalyx*	Rubiaceae	BEL2	112	0.1034	Treelet	L Gui-Cong
Camptostylus	*mannii*	Achariaceae	CAMP	143	0.3376	Understory	L Gui
Campylospermum	*calanthum*	Ochnaceae	OURA	498	0.5449	Treelet	L Gui
Campylospermum	*flavum*	Ochnaceae	OUR2	221	0.0351	Treelet	U&L Gui
Campylospermum	*mannii*	Ochnaceae	OUEL	222	0.0573	Treelet	Nig-Cam
Campylospermum	*sulcatum*	Ochnaceae	OUR6	91	0.0132	Treelet	U&L Gui
Canthium	sp. 1	Rubiaceae	CABL	1	1e-04	Treelet	.
Canthium	sp. 2	Rubiaceae	CAN4	33	0.1148	Canopy	.
Canthium	sp. 3	Rubiaceae	CANI	145	0.2011	Understory	.
Carapa	*dinklagei*	Meliaceae	CABM	18	1.0477	Canopy	L Gui
Carapa	*parvifolia*	Meliaceae	CAPR	782	7.1042	Canopy	L Gui
Carpolobia	*lutea*	Polygalaceae	CALU	485	0.1245	Treelet	U&L Gui
Casearia	*barteri*	Salicaceae	WHOM	80	0.3792	Understory	L Gui
Cassipourea	*korupensis*	Rhizophoraceae	RUDR	47	0.1495	Understory	Korup
Ceiba	*pentandra*	Malvaceae	CEPE	2	0.0114	Emergent	Africa
Cephaelis	sp.	Rubiaceae	CEPH	10	0.004	Treelet	.
Chrysobalanus	*icaco*	Chrysobalanaceae	WIRG	62	0.4534	Canopy	Africa
Chrysophyllum	*delevoyi*	Sapotaceae	GAAF	33	0.3322	Canopy	U&L Gui
Chrysophyllum	sp. nov.	Sapotaceae	SAPO	160	0.3549	Understory	Korup
Chytranthus	sp. 1	Sapindaceae	CHY1	1	3e-04	Treelet	.
Chytranthus	sp. 2	Sapindaceae	CHY2	47	0.0105	Treelet	.
Chytranthus	sp.3	Sapindaceae	CHY4	89	0.0347	Treelet	.
Chytranthus	*talbotii*	Sapindaceae	CHTA	345	0.4915	Understory	U&L Gui
Cleistanthus	*letouzeyi*	Phyllanthaceae	WDAS	43	0.2203	Understory	L Gui
Cleistopholis	*patens*	Annonaceae	CLPA	38	0.7995	Canopy	Gui-Cong
Cleistopholis	*staudtii*	Annonaceae	CLSP	11	1.5895	Canopy	L Gui
Coelocaryon	*preussii*	Myristicaceae	COPR	87	5.3102	Emergent	L Gui-Cong
Coffea	*liberica*	Rubiaceae	COSS	1	2e-04	Treelet	Gui-Cong
Cola	*acuminata*	Malvaceae	CONI	189	2.8933	Understory	Gui-Cong
Cola	*altissima*	Malvaceae	COAL	4	0.0019	Canopy	L Gui
Cola	*cauliflora*	Malvaceae	COCA	4272	4.8927	Treelet	L Gui
Cola	*chlamydantha*	Malvaceae	COCH	191	0.3249	Understory	U&L Gui
Cola	*digitata*	Malvaceae	CODI	414	0.1433	Treelet	U&L Gui
Cola	*flaviflora*	Malvaceae	COTL	23	0.016	Treelet	L Gui
Cola	*gabonensis*	Malvaceae	COGA	4	5e-04	Treelet	L Gui
Cola	*heterophylla*	Malvaceae	COLS	47	0.0102	Treelet	U&L Gui
Cola	*lateritia*	Malvaceae	COLA	465	16.2496	Emergent	Gui-Cong
Cola	*lepidota*	Malvaceae	COLE	285	1.5807	Understory	L Gui
Cola	*marsupium*	Malvaceae	COMA	1	0.002	Treelet	L Gui
Cola	*megalophylla*	Malvaceae	COME	20	0.8221	Emergent	Nig-Cam
Cola	*pachycarpa*	Malvaceae	COPA	27	0.1311	Understory	L Gui
Cola	*praeacuta*	Malvaceae	COL2	1549	34.8528	Treelet	Nig-Cam
Cola	*rostrata*	Malvaceae	CORO	3288	25.3913	Understory	L Gui
Cola	*semecarpophylla*	Malvaceae	COSE	2453	53.3014	Treelet	Nig-Cam
Cola	sp. 2	Malvaceae	COBE	1	3e-04	Treelet	.
Cola	sp. 5	Malvaceae	COLSL	2	2e-04	Treelet	.
Cola	sp. 6	Malvaceae	COMT	4	0.002	Treelet	.
Cola	sp. nov. 2	Malvaceae	COAT	12396	6.8912	Treelet	Korup

Appendix 1 continued

Genus	Species	Family	Code	*N*	*BA*	Form	Range
Cola	sp. nov. 3	Malvaceae	OCTI	8244	5.9463	Treelet	Korup
Cola	*subopposititifolia*	Malvaceae	CONS	358	0.14	Treelet	Nig-Cam
Cola	*verticillata*	Malvaceae	COVE	87	4.2119	Emergent	U&L Gui
Copaifera	*mildbraedii*	Fabaceae	CAE3	8	0.1553	Emergent	L Gui-Cong
Cordia	sp.	Boraginaceae	SIFB	5	0.0482	Understory	.
Coula	*edulis*	Olacaceae	COED	8	0.3554	Canopy	U&L Gui
Crateranthus	*talbotii*	Lecythidaceae	CRTA	18	0.0246	Understory	Nig-Cam
Craterispermum	*aristatum*	Rubiaceae	CRAR	2625	2.7173	Treelet	Nig-Cam
Craterispermum	*caudatum*	Rubiaceae	RUGA	59	0.0306	Treelet	U&L Gui
Croton	*longiracemosus*	Euphorbiaceae	NEGL	112	3.9922	Canopy	.
Crotonogyne	*strigosa*	Euphorbiaceae	CRST	3888	1.2752	Treelet	L Gui
Crotonogynopsis	sp. nov.	Euphorbiaceae	ALEX	2158	0.9347	Treelet	Korup
Crudia	sp.	Fabaceae	CRUD	1	0.2489	Emergent	.
Dacryodes	*edulis*	Burseraceae	DAED	75	5.0607	Canopy	L Gui
Dacryodes	*klaineana*	Burseraceae	DAKL	114	2.2306	Canopy	U&L Gui
Dactyladenia	*pallescens*	Chrysobalanaceae	ACI2	155	0.5435	Understory	L Gui
Dactyladenia	*staudtii*	Chrysobalanaceae	ACST	75	0.1607	Understory	L Gui
Dasylepis	*blackii*	Achariaceae	DABL	2144	7.2305	Understory	L Gui
Deinbollia	*maxima*	Sapindaceae	CHY3	501	0.2791	Treelet	U&L Gui
Deinbollia	*pychnophylla*	Sapindaceae	COSL	109	0.7361	Understory	L Gui
Deinbollia	*unijuga*	Sapindaceae	DEUN	6	7e-04	Treelet	Korup
Desbordesia	*glaucescens*	Irvingiaceae	DEGL	85	25.0731	Emergent	L Gui-Cong
Dialium	*pachyphyllum*	Fabaceae	DIAL	353	3.5118	Canopy	L Gui
Dialium	sp.	Fabaceae	DIA3	66	2.4708	Canopy	.
Dichaetanthera	*africana*	Melastomataceae	DIAF	3	0.0213	Treelet	Gui-Cong
Dichostemma	*glaucescens*	Euphorbiaceae	DIGL	17255	78.804	Canopy	L Gui-Cong
Dicranolepis	*disticha*	Thymelaeaceae	DIDI	9	0.0017	Treelet	U&L Gui
Dicranolepis	sp.	Thymelaeaceae	DICR	2	0.1495	Treelet	.
Didymosalpinx	sp.	Rubiaceae	RUBT	470	0.5067	Treelet	.
Dinophora	*spenneroides*	Melastomataceae	DINO	2	2e-04	Treelet	Gui-Cong
Diogoa	*zenkeri*	Olacaceae	DIOG	3220	12.4436	Canopy	L Gui-Cong
Diospyros	*bipindensis*	Ebenaceae	DIBI	3	0.0095	Understory	L Gui-Cong
Diospyros	*gabunensis*	Ebenaceae	DIGA	3899	27.6102	Canopy	U&L Gui
Diospyros	*gracilescens*	Ebenaceae	DICI	163	2.5099	Emergent	L Gui
Diospyros	*hoyleana*	Ebenaceae	DIHO	281	0.6836	Understory	Gui-Cong
Diospyros	*iturensis*	Ebenaceae	DIIT	4795	13.6023	Understory	L Gui-Cong
Diospyros	*mannii*	Ebenaceae	DIMA	87	0.3206	Emergent	U&L Gui
Diospyros	*obliquifolia*	Ebenaceae	DIOB	729	0.3901	Treelet	L Gui
Diospyros	*physocalycina*	Ebenaceae	DIO2	9	0.0082	Treelet	L Gui
Diospyros	*preussii*	Ebenaceae	DIPR	7359	3.3379	Treelet	L Gui
Diospyros	*pseudomespilus*	Ebenaceae	DIPS	1039	3.3276	Canopy	Nig-Cam
Diospyros	sp. 1	Ebenaceae	DIBM	8	0.4093	Canopy	.
Diospyros	sp. 2	Ebenaceae	DIOY	111	0.0846	Treelet	.
Diospyros	sp. 3	Ebenaceae	NDIO	5	0.1415	Canopy	Gui-Cong
Diospyros	*zenkeri*	Ebenaceae	DIZE	655	4.8005	Understory	L Gui
Discoclaoxylon	*hexandrum*	Euphorbiaceae	CLHE	37	0.2272	Canopy	Gui-Cong
Discoglypremna	*caloneura*	Euphorbiaceae	DICA	167	6.7191	Emergent	Gui-Cong
Dorstenia	*turbinata*	Moraceae	DORS	10	0.001	Treelet	U&L Gui
Dracaena	*bicolor*	Ruscaceae	DRAI	171	0.088	Treelet	U&L Gui
Dracaena	*cf.goldieana*	Ruscaceae	DRAT	1	1e-04	Treelet	Korup
Dracaena	*laxissima*	Ruscaceae	DRAJ	54	0.0081	Treelet	Africa
Dracaena	sp.	Ruscaceae	DRA2	12	0.0062	Treelet	.
Dracaena	*surculosa*	Ruscaceae	DRA3	4	5e-04	Treelet	U&L Gui
Drypetes	*ivorensis*	Putrangivaceae	DRYS	113	0.1428	Treelet	U&L Gui
Drypetes	*laciniata*	Putrangivaceae	DRLA	249	0.138	Treelet	L Gui
Drypetes	*molunduana*	Putrangivaceae	DRY3	26	0.0091	Treelet	Nig-Cam

Appendix 1 continued

Genus	Species	Family	Code	*N*	*BA*	Form	Range
Drypetes	*principum*	Putrangivaceae	DRSI2	3043	1.7722	Treelet	U&L Gui
Drypetes	sp.	Putrangivaceae	CAR2	47	0.2281	Understory	.
Drypetes	*staudtii*	Putrangivaceae	DRST	4101	25.9534	Understory	Nig-Cam
Duboscia	*macrocarpa*	Malvaceae	DUMA	2	0.0012	Canopy	L Gui-Cong
Endodesmia	*calophylloides*	Clusiaceae	ENCA	270	3.4477	Emergent	L Gui
Englerophytum	sp. nov.	Sapotaceae	ENGI	652	2.4754	Understory	Korup
Engomegoma	*gordonii*	Olacaceae	WCOU	1	0.5555	Canopy	L Gui
Entandrophragma	*cylindricum*	Meliaceae	ENTI	44	0.0585	Emergent	Gui-Cong
Eriocoelum	sp.	Sapindaceae	ERIO	76	1.5052	Canopy	.
Erismadelphus	*exsul*	Vochysiaceae	EREX	251	13.7765	Emergent	L Gui
Erythrina	sp.	Fabaceae	ERAD	8	0.1152	Canopy	.
Erythrophleum	*ivorense*	Fabaceae	ERIV	79	24.5632	Emergent	U&L Gui
Erythroxylum	*mannii*	Rhizophoraceae	ALFB	21	1.3316	Emergent	U&L Gui
Euclinia	*longiflora*	Rubiaceae	EULO	131	0.0872	Treelet	Gui-Cong
Eugenia	*callophyloides*	Myrtaceae	EUG2	30	0.0273	Treelet	U&L Gui
Eugenia	*fernandopoana*	Myrtaceae	EUGT	24	0.0885	Understory	L Gui
Eugenia	*talbotii*	Myrtaceae	EUGI	285	0.0433	Treelet	Nig-Cam
Eurypetalum	*unijugum*	Fabaceae	EUUN	7	0.3198	Understory	L Gui
Fagara	*macrophylla*	Rutaceae	ZAMA	109	2.7442	Canopy	L Gui-Cong
Ficus	sp.	Moraceae	FICU	3	0.0773	Treelet	.
Funtumia	*elastica*	Apocynaceae	FUEL	11	0.2239	Canopy	Gui-Cong
Gaertnera	*bieleri*	Rubiaceae	GABI	714	0.1575	Treelet	L Gui-Cong
Gaertnera	*letouzeyi*	Rubiaceae	GAET	7	0.001	Treelet	Korup
Garcinia	*conrauana*	Clusiaceae	GACO	1287	11.5199	Understory	L Gui
Garcinia	*Guietoides*	Clusiaceae	GAR2	1141	1.5443	Understory	U&L Gui
Garcinia	*kola*	Clusiaceae	GAKO	20	0.0935	Canopy	Gui-Cong
Garcinia	*mannii*	Clusiaceae	GAMA	158	0.6207	Understory	L Gui
Garcinia	*ovalifolia*	Clusiaceae	GAOV	151	0.2874	Understory	Gui-Cong
Garcinia	*polyandra*	Clusiaceae	GATB	1	2e-04	Treelet	Gui-Cong
Garcinia	*smeathmannii*	Clusiaceae	GAR4	38	0.2925	Understory	Gui-Cong
Garcinia	sp.1	Clusiaceae	GAR3	29	0.0086	Treelet	.
Garcinia	sp. 2	Clusiaceae	GAR5	2	4e-04	Treelet	.
Garcinia	sp. 3	Clusiaceae	NGAR	1	1e-04	Treelet	.
Gilbertiodendron	*demonstrans*	Fabaceae	GIDE	288	2.0869	Understory	L Gui
Glossocalyx	*brevipes*	Monimiaceae	GLBR	1070	0.8259	Treelet	L Gui
Glyphaea	sp.	Malvaceae	HGRE	14	0.0091	Treelet	.
Guarea	*glomerulata*	Meliaceae	GUGL	17	0.0064	Treelet	L Gui
Guarea	sp.	Meliaceae	GUA2	16	0.005	Treelet	.
Guarea	*thompsonii*	Meliaceae	GUAR	116	7.8413	Emergent	Gui-Cong
Hallea	*ledermannii*	Rubiaceae	MICI	69	5.5641	Emergent	Gui-Cong
Heckeldora	*staudtii*	Meliaceae	SMEL	6	8e-04	Treelet	L Gui
Heinsia	*crinita*	Rubiaceae	HECR	103	0.359	Treelet	Africa
Heisteria	*parvifolia*	Olacaceae	HEPA	1174	0.1943	Treelet	U&L Gui
Homalium	*africanum*	Salicaceae	HOMO	45	3.0684	Canopy	U&L Gui
Homalium	*africanum*	Salicaceae	HOSA	88	0.4298	Understory	L Gui
Homalium	*letestui*	Salicaceae	HOM2	618	2.5702	Emergent	U&L Gui
Homalium	*longistylum*	Salicaceae	HOLO	535	8.9453	Emergent	Africa
Homalium	sp.	Salicaceae	HOM4	1	0.0028	Understory	.
Hoplestigma	*kleineanum*	Hoplestigmataceae	ALTB	19	0.3611	Canopy	U&L Gui
Hunteria	*umbellata*	Apocynaceae	HUUM	874	8.462	Canopy	Gui-Cong
Hylodendron	*gabunense*	Fabaceae	HYGA	13	1.9989	Emergent	L Gui-Cong
Hymenostegia	*afzelii*	Fabaceae	HYAF	4025	27.6981	Canopy	U&L Gui
Hymenostegia	*bakeriana*	Fabaceae	HYBA	203	6.4259	Emergent	Nig-Cam
Hymenostegia	sp. nov.	Fabaceae	CAE2	51	2.4632	Emergent	Korup
Hypodaphnis	*zenkeri*	Lauraceae	HYZE	299	16.026	Canopy	L Gui
Irvingia	*gabonensis*	Irvingiaceae	IRGA	134	10.0348	Emergent	U&L Gui
Irvingia	*grandifolia*	Irvingiaceae	IRGR	15	0.5895	Emergent	L Gui-Cong

Appendix 1 continued

Genus	Species	Family	Code	*N*	*BA*	Form	Range
Irvingia	*smithii*	Irvingiaceae	IRVI	1	0.7776	Emergent	Gui-Cong
Isolona	*campanulata*	Annonaceae	MONO	256	1.2568	Canopy	U&L Gui
Isolona	sp.	Annonaceae	WMON	86	0.0563	Treelet	.
Ixora	*hippoperifera*	Rubiaceae	IXHI	552	0.152	Treelet	L Gui
Ixora	*nematopoda*	Rubiaceae	RUBI	1446	0.3427	Treelet	L Gui
Jollydora	*duparquetiana*	Connaraceae	JOLY	585	0.2804	Treelet	L Gui-Cong
Jollydora	*glandulosa*	Connaraceae	JOL2	583	0.4115	Treelet	Nig-Cam
Keayodendron	*bridelioides*	Euphorbiaceae	KEBR	2	0.3641	Canopy	U&L Gui
Kigelia	*africana*	Bignoniaceae	KIAF	8	0.0345	Canopy	Africa
Klaineanthus	*gaboniae*	Euphorbiaceae	KLGI	2032	30.8603	Canopy	L Gui
Klainedoxa	*gabonensis*	Irvingiaceae	KLGA	8	2.9646	Emergent	L Gui-Cong
Klainedoxa	*trillesii*	Irvingiaceae	KLTR	7	2.4587	Emergent	Gui-Cong
Korupodendron	*songweanum*	Vochysiaceae	PTHY	16	2.1417	Emergent	L Gui
Laccodiscus	*ferrugineus*	Sapindaceae	LAFE	492	0.1625	Treelet	L Gui
Laccodiscus	*pseudostipulari*	Sapindaceae	LACC	39	0.1412	Canopy	L Gui-Cong
Lannea	sp.	Anacardiaceae	LANN	16	0.0728	Treelet	Korup
Lasianthera	*africana*	Icacinaceae	LAAF	792	0.508	Treelet	L Gui
Lasianthus	*batangensis*	Rubiaceae	LABA	5	5e-04	Treelet	U&L Gui
Lasiodiscus	sp.	Rhamnaceae	LASI	164	0.0798	Treelet	.
Lecomtedoxa	*klaineana*	Sapotaceae	LEKL	303	99.2725	Emergent	L Gui
Lepidobotrys	*staudtii*	Lepidobotryaceae	PAPI	11	1.6955	Canopy	Gui-Cong
Leptaulus	*daphnoides*	Icacinaceae	LEDA	474	4.9051	Understory	Africa
Leptaulus	*holstii*	Icacinaceae	LEPT	1	1e-04	Treelet	Africa
Leptonychia	*echinocarpa*	Malvaceae	LEEC	576	0.1615	Treelet	L Gui
Leptonychia	*pallida*	Malvaceae	LEPA	961	0.3807	Treelet	L Gui
Licania	*elaeosperma*	Chrysobalanaceae	LIEL	2	0.3063	Canopy	Gui-Cong
Lophira	*alata*	Ochnaceae	LOAL	39	9.8259	Emergent	U&L Gui
Macaranga	*monandra*	Euphorbiaceae	MAMO	199	1.9403	Canopy	Gui-Cong
Maesobotrya	*barteri*	Phyllanthaceae	MABA	2357	1.8686	Treelet	L Gui
Maesobotrya	*dusenii*	Phyllanthaceae	MADU	1081	4.1649	Understory	L Gui
Maesobotrya	*staudtii*	Phyllanthaceae	MAST	212	0.3384	Understory	L Gui
Maesopsis	*eminii*	Rhamnaceae	MAEM	52	2.1183	Canopy	Africa
Magnistipula	*cuneatifolia*	Chrysobalanaceae	MAGUI	9	0.7615	Treelet	L Gui
Magnistipula	*glaberrima*	Chrysobalanaceae	MAGL	167	1.5137	Canopy	L Gui
Magnistipula	sp.	Chrysobalanaceae	CHR2	5	0.0023	Canopy	.
Mammea	*africana*	Clusiaceae	MAAF	56	0.8646	Canopy	Gui-Cong
Manilkara	*lososiana*	Sapotaceae	ENG2	1	4e-04	Canopy	Korup
Maprounea	*membranacea*	Euphorbiaceae	MAME	69	1.9353	Canopy	U&L Gui
Maranthes	sp.	Chrysobalanaceae	CHRY	30	0.3989	Emergent	.
Mareya	*micrantha*	Euphorbiaceae	MAMI	19	0.1905	Understory	Gui-Cong
Mareyopsis	*longifolia*	Euphorbiaceae	MALO	464	0.9861	Treelet	L Gui-Cong
Margaritaria	*discoidea*	Phyllanthaceae	MADI	17	0.9885	Canopy	Africa
Massularia	*acuminata*	Rubiaceae	MAAC	2844	2.7275	Treelet	Gui-Cong
Memecylon	*afzelii*	Memecylaceae	MEM4	247	0.1701	Treelet	Gui-Cong
Memecylon	*englerianum*	Memecylaceae	MEML	193	0.0658	Treelet	U&L Gui
Memecylon	*lateriflorum*	Memecylaceae	MEMT3	890	1.0163	Understory	U&L Gui
Memecylon	*laurentii*	Memecylaceae	MEMT	109	0.7579	Canopy	L Gui
Memecylon	sp.	Memecylaceae	WMEM	74	0.0998	Treelet	.
Memecylon	*zenkeri*	Memecylaceae	WWAR	3	8e-04	Treelet	Nig-Cam
Microcos	*coriacea*	Malvaceae	GRCO	198	3.4558	Canopy	L Gui
Microdesmis	*puberula*	Pandaceae	MIPU	823	0.1854	Treelet	L Gui-Cong
Monodora	*brevipes*	Annonaceae	MOBI	21	0.5919	Canopy	U&L Gui
Morelia	*senegalensis*	Rubiaceae	RUDO	54	0.2499	Understory	U&L Gui
Morinda	*lucida*	Rubiaceae	MOLU	10	0.3351	Canopy	U&L Gui
Mostuea	*brunonis*	Gelsemiaceae	MOBR	64	0.0072	Treelet	U&L Gui
Musanga	*cecropioides*	Urticaceae	MUCE	169	5.7304	Canopy	Africa
Mussaenda	sp.	Rubiaceae	MUSA	1	1e-04	Treelet	.

Appendix 1 continued

Genus	Species	Family	Code	*N*	*BA*	Form	Range
Napoleonaea	*heudelotii*	Lecythidaceae	NAK5	6	0.0138	Treelet	U&L Gui
Napoleonaea	*talbotii*	Lecythidaceae	NATA	135	0.1194	Treelet	L Gui
Napoleonaea	*vogelii*	Lecythidaceae	NAPS	26	0.0508	Treelet	L Gui
Nauclea	*diderrichii*	Rubiaceae	NADI	19	6.5174	Emergent	Gui-Cong
Nauclea	*vanderguchtii*	Rubiaceae	MITR	7	0.0891	Canopy	L Gui
Newtonia	*duparquetiana*	Fabaceae	NEDU	78	1.9473	Emergent	U&L Gui
Newtonia	*griffoniana*	Fabaceae	NEWI	39	0.0788	Emergent	L Gui-Cong
Nichallea	*soyauxii*	Rubiaceae	ROT5	30	0.0079	Treelet	Gui-Cong
Octoknema	*affinis*	Olacaceae	OCAF	256	2.4398	Canopy	L Gui-Cong
Olax	*latifolia*	Olacaceae	OLAI	71	0.0088	Treelet	L Gui
Olax	*triplinerva*	Olacaceae	OLTR	47	0.0061	Treelet	L Gui
Omphalocarpum	*elatum*	Sapotaceae	OMPI	16	0.9482	Emergent	U&L Gui
Opilia	sp.	Opiliaceae	OPIL	4	0.0014	Treelet	.
Oricia	*lecomteana*	Rutaceae	ARAL	99	0.0665	Treelet	Nig-Cam
Oricia	*renieri*	Rutaceae	RUTA	3	0.0031	Treelet	U&L Gui
Ormocarpum	*megalophyllum*	Fabaceae	ORMO	10	0.0016	Treelet	U&L Gui
Oubanguia	*alata*	Lecythidaceae	OUAL	14932	218.6065	Canopy	L Gui
Oubanguia	*laurifolia*	Lecythidaceae	OULA	93	0.2448	Canopy	L Gui
Ouratea	sp. 1	Ochnaceae	OUFB	13	0.0132	Treelet	.
Oxyanthus	*formosus*	Rubiaceae	RUAS	2	7e-04	Treelet	L Gui
Oxyanthus	*laxiflorus*	Rubiaceae	OXY2	129	0.0575	Treelet	L Gui
Pachypodanthium	sp.	Annonaceae	PACH	173	0.6091	Emergent	.
Pachypodanthium	*staudtii*	Annonaceae	PAST	8	0.6146	Emergent	Gui-Cong
Panda	*oleosa*	Pandaceae	PAOL	35	1.59	Canopy	L Gui-Cong
Pauridiantha	*afzelii*	Rubiaceae	RUBG	84	0.0083	Treelet	U&L Gui
Pauridiantha	*floribunda*	Rubiaceae	PAFL	264	1.5269	Understory	L Gui
Pauridiantha	*viridiflora*	Rubiaceae	PSYC	1	0.0043	Treelet	L Gui-Cong
Pausinystalia	*macroceras*	Rubiaceae	RUB9	447	5.5646	Canopy	L Gui
Pavetta	*rigida*	Rubiaceae	COBN	43	0.0055	Treelet	Nig-Cam
Pavetta	sp. 1	Rubiaceae	PANO	74	0.0267	Treelet	.
Pavetta	sp. 2	Rubiaceae	RUBN	15	0.0055	Treelet	.
Pentadesma	*butyracea*	Clusiaceae	PEBU	66	3.6517	Emergent	U&L Gui
Pentadesma	*grandifolia*	Clusiaceae	PENT	30	0.9017	Canopy	L Gui
Petitiocodon	*parviflorum*	Rubiaceae	COF2	125	0.0615	Treelet	L Gui
Phyllanthus	sp.	Phyllanthaceae	RUT2	2	0.0026	Treelet	.
Phyllanthus	sp.	Phyllanthaceae	RUTS	7	0.1114	Canopy	.
Phyllobotryon	sp.	Salicaceae	PHYP	8	0.0027	Treelet	.
Phyllobotryon	*spathulatum*	Salicaceae	PHSP	26741	12.2868	Treelet	L Gui
Pierreodendron	*africanum*	Simaroubaceae	ENT2	7	0.5472	Canopy	L Gui
Piptadeniastrum	*africanum*	Fabaceae	PIAF	21	3.4182	Emergent	Gui-Cong
Piptostigma	*oyemense*	Annonaceae	PIPI	1032	3.6617	Understory	L Gui
Placodiscus	sp.	Sapindaceae	PLA	1290	2.0654	Treelet	.
Pleiocarpa	*bicarpellata*	Apocynaceae	PLEI	6	0.0052	Treelet	L Gui-Cong
Pleiocarpa	*rostrata*	Apocynaceae	PLTA	482	0.1858	Treelet	L Gui
Poga	*oleosa*	Anisophylleaceae	POOL	11	13.4212	Emergent	L Gui-Cong
Polyceratocarpus	*parviflorus*	Annonaceae	POPA	2048	2.9843	Treelet	U&L Gui
Polysphaeria	*macrophylla*	Rubiaceae	POMA	737	0.3906	Treelet	U&L Gui
Protomegabaria	*stapfiana*	Phyllanthaceae	PRST	3375	73.2105	Canopy	U&L Gui
Pseudospondias	*microcarpa*	Anacardiaceae	PSEU	60	2.3765	Canopy	Gui-Cong
Psilanthus	*mannii*	Rubiaceae	RUWS	75	0.0112	Treelet	Gui-Cong
Psorospermun	*tenuifolium*	Clusiaceae	PSOR	15	0.0039	Treelet	L Gui
Psychotria	*dorotheae*	Rubiaceae	PSYI	925	0.2059	Treelet	U&L Gui
Psychotria	sp. 1	Rubiaceae	NPSY	3	9e-04	Treelet	.
Psychotria	sp. 10	Rubiaceae	PSYT	1	1e-04	Treelet	.
Psychotria	sp. 2	Rubiaceae	PSEL	1	1e-04	Treelet	.
Psychotria	sp. 3	Rubiaceae	PSY2	43	0.0067	Treelet	.

Appendix 1 continued

Genus	Species	Family	Code	*N*	*BA*	Form	Range
Psychotria	sp. 4	Rubiaceae	PSY3	21	0.0035	Treelet	.
Psychotria	sp. 5	Rubiaceae	PSY4	27	0.0056	Treelet	.
Psychotria	sp. 6	Rubiaceae	PSY5	6	0.0011	Treelet	.
Psychotria	sp. 7	Rubiaceae	PSY6	5	8e-04	Treelet	.
Psychotria	sp. 8	Rubiaceae	PSYL	141	0.1145	Treelet	.
Psychotria	sp. 9	Rubiaceae	PSYS	43	0.0063	Treelet	.
Pterocarpus	*soyauxii*	Fabaceae	DIA4	18	0.0183	Emergent	L Gui
Ptychopetalum	*petiolatum*	Olacaceae	PTPE	243	0.9132	Understory	L Gui
Pycnanthus	*angolensis*	Myristicaceae	PYAN	25	0.1101	Emergent	Africa
Pycnocoma	*macrophylla*	Euphorbiaceae	PYMA	1332	1.0179	Treelet	U&L Gui
Rauvolfia	*caffra*	Apocynaceae	RAMA	49	3.786	Canopy	Gui-Cong
Rauvolfia	*mannii*	Apocynaceae	VOA2	115	0.0172	Treelet	L Gui-Cong
Rauvolfia	*vomitoria*	Apocynaceae	RAVO	56	0.4359	Understory	Gui-Cong
Rhabdophyllum	sp.	Ochnaceae	RHAB	13	0.0043	Treelet	.
Rhaptopetalum	sp. 1	Lecythidaceae	RHA3	47	0.8529	Canopy	.
Rhaptopetalum	sp. 2	Lecythidaceae	RHA4	2	7e-04	Treelet	.
Rhaptopetalum	sp. nov.	Lecythidaceae	RHA2	292	0.7115	Understory	Korup
Rinorea	cf. *woermanniana*	Violaceae	RIN9	1049	0.1624	Treelet	.
Rinorea	*crassifolia*	Violaceae	RINB	697	0.0909	Treelet	Nig-Cam
Rinorea	*dentata*	Violaceae	RIN6	3499	2.6413	Treelet	Africa
Rinorea	*gabunensis*	Violaceae	RINC2	4572	1.9577	Treelet	L Gui
Rinorea	*kamerunensis*	Violaceae	RINA	3401	0.6102	Treelet	L Gui
Rinorea	*leiophylla*	Violaceae	RINI	3404	2.4442	Treelet	L Gui
Rinorea	*lepidobotrys*	Violaceae	RILE	5512	9.5489	Treelet	U&L Gui
Rinorea	*longicuspis*	Violaceae	NRIN	11	0.0093	Treelet	U&L Gui
Rinorea	*oblongifolia*	Violaceae	RIN2	3021	8.3864	Understory	Africa
Rinorea	sp. 2	Violaceae	RIN8	193	0.0297	Treelet	.
Rinorea	sp. 3	Violaceae	RISP	3	0.0021	Treelet	.
Rinorea	*subintegrifolia*	Violaceae	RIN3	4707	1.8189	Treelet	Africa
Rinorea	*thomasii*	Violaceae	RINO	461	0.0887	Treelet	Nig-Cam
Ritchiea	sp.	Brassicaceae	RITC	1	1e-04	Treelet	.
Rothmannia	*hispida*	Rubiaceae	ROTH	181	0.3015	Treelet	U&L Gui
Rothmannia	*lujae*	Rubiaceae	ROBS	1	0.0119	Understory	L Gui-Cong
Rothmannia	sp.	Rubiaceae	ROT4	2	5e-04	Treelet	.
Rothmannia	*talbotii*	Rubiaceae	ROLU	398	0.2316	Treelet	L Gui-Cong
Sacoglottis	*gabonensis*	Humiriaceae	SAGA	2	1.1931	Emergent	U&L Gui
Salacia	*lehmbachii*	Celastraceae	SAL2	1106	0.6664	Treelet	Gui-Cong
Salacia	*loloensis*	Celastraceae	SALI	739	0.2353	Treelet	L Gui
Salacia	sp.	Celastraceae	SAAB	1	4e-04	Treelet	.
Salacia	sp. nov.	Celastraceae	SALS	564	0.085	Treelet	L Gui
Santiria	*balsamifera*	Burseraceae	SATR	138	7.304	Emergent	U&L Gui
Sapium	*ellipticum*	Euphorbiaceae	EUPI	64	3.0913	Canopy	Africa
Scaphopetalum	*blackii*	Malvaceae	SCAI	428	0.0631	Treelet	L Gui
Schumanniophyton	*magnificun*	Rubiaceae	SCMA	1425	0.3828	Treelet	L Gui-Cong
Scottellia	*klaineana*	Achariaceae	SCCO	599	11.5492	Emergent	Gui-Cong
Scyphocephalium	*mannii*	Myristicaceae	SCYP	4	0.0116	Emergent	L Gui
Scytopetalum	*klaineanum*	Lecythidaceae	SCKL	200	6.6969	Emergent	L Gui
Sericanthe	*auriculata*	Rubiaceae	HEI2	30	0.0341	Treelet	L Gui
Sibangea	*similis*	Putrangivaceae	DRSI	713	0.4419	Treelet	L Gui
Sorindeia	*grandifolia*	Anacardiaceae	DAMA	12	0.0144	Treelet	L Gui
Sorindeia	*juglandifolia*	Anacardiaceae	SOJU	344	1.5937	Understory	U&L Gui
Soyauxia	*gabonensis*	Medusandraceae	SOTA	3182	16.7249	Understory	L Gui
Spathodea	*campanulata*	BiGuioniaceae	SPCA	1	0.0257	Canopy	Africa
Staudtia	*gabunensis*	Myristicaceae	STST	8	1.8503	Emergent	L Gui
Staudtia	*kamerunensis*	Myristicaceae	STAU	194	13.4438	Emergent	Gui-Cong
Sterculia	*oblonga*	Malvaceae	EROB	5	0.2334	Canopy	Gui-Cong

Appendix 1 continued

Genus	Species	Family	Code	*N*	*BA*	Form	Range
Sterculia	*tragacantha*	Malvaceae	STER	38	0.6308	Emergent	Gui-Cong
Stipularia	*africana*	Rubiaceae	RUBR	78	0.0111	Treelet	U&L Gui
Strephonema	*pseudocola*	Combretaceae	STPO	146	14.217	Emergent	U&L Gui
Strombosia	*grandifolia*	Olacaceae	STGR	18	0.4006	Understory	U&L Gui
Strombosia	*pustulata*	Olacaceae	STPU	4119	34.4039	Canopy	Gui-Cong
Strombosia	*scheffleri*	Olacaceae	STSC	1216	14.0917	Canopy	Gui-Cong
Strombosia	sp.	Olacaceae	STRO	2523	16.0292	Canopy	.
Strombosiopsis	*tetrandra*	Olacaceae	STTE	1763	23.0436	Canopy	L Gui-Cong
Strychnos	sp.	Loganiaceae	STCO	7	0.6695	Canopy	.
Symphonia	*globulifera*	Clusiaceae	SYGL	805	1.463	Emergent	Africa
Synsepallum	*stipulatum*	Sapotaceae	SYST	199	2.2383	Understory	L Gui-Cong
Syzygium	*guineense*	Myrtaceae	SYGU	5	0.2188	Canopy	Africa
Syzygium	*rowlandii*	Myrtaceae	SYRO	72	2.1322	Canopy	U&L Gui
Tabernaemontana	*brachyantha*	Apocynaceae	TABR	3583	15.3003	Canopy	L Gui
Tabernaemontana	*crassa*	Apocynaceae	TACR	674	2.0902	Canopy	Gui-Cong
Talbotiella	*eketensis*	Fabaceae	TAEK	924	10.6727	Canopy	Nig-Cam
Tapura	*africana*	Dichapetalaceae	TAAF	418	11.2514	Canopy	L Gui
Tarenna	*conferta*	Rubiaceae	RUTL	49	0.0233	Treelet	L Gui-Cong
Tarenna	*lasiorachis*	Rubiaceae	RUB8	88	0.0543	Treelet	L Gui
Tetrapleura	*tetraptera*	Fabaceae	TETE	8	0.8596	Emergent	Gui-Cong
Thecacoris	*leptobotrya*	Phyllanthaceae	EUP2	39	0.0071	Treelet	L Gui-Cong
Thecacoris	sp.	Phyllanthaceae	THEC	131	1.9599	Canopy	.
Treculia	*acuminata*	Moraceae	TREI	133	0.0321	Treelet	L Gui
Treculia	*africana*	Moraceae	TRAF	71	0.5562	Emergent	Gui-Cong
Treculia	*obovoidea*	Moraceae	TROB	38	1.0111	Canopy	L Gui-Cong
Tricalysia	*achoundongiana*	Rubiaceae	RUBP	625	0.1849	Treelet	L Gui
Tricalysia	*pangolina*	Rubiaceae	ROT3	13	0.0183	Treelet	L Gui
Trichilia	*prieureana*	Meliaceae	TRSP	210	1.0495	Understory	Gui-Cong
Trichilia	sp.	Meliaceae	TRWE	207	0.5796	Canopy	.
Trichoscypha	*acuminata*	Anacardiaceae	TRAC	30	1.725	Canopy	L Gui-Cong
Trichoscypha	*klainei*	Anacardiaceae	TRI3	1338	0.6636	Treelet	.
Trichoscypha	*patens*	Anacardiaceae	TRI2	1120	1.5909	Understory	L Gui
Trichoscypha	*preussii*	Anacardiaceae	TRIC	193	0.619	Understory	U&L Gui
Trichoscypha	sp.	Anacardiaceae	TRIR	752	0.6728	Treelet	.
Trichoscypha	sp. 1	Anacardiaceae	TR22	77	0.0221	Treelet	.
Trichoscypha	sp. 2	Anacardiaceae	TRBM	25	1.0108	Emergent	.
Trichoscypha	sp. 3	Anacardiaceae	TRHM	147	0.6309	Understory	.
Trichoscypha	sp. 4	Anacardiaceae	TRI4	302	0.5262	Understory	.
Trichoscypha	sp. 5	Anacardiaceae	TRI72	80	0.2913	Understory	.
Turraeanthus	*mannii*	Meliaceae	TUMA	251	0.0563	Treelet	Nig-Cam
Turreanthus	sp.	Meliaceae	TUMA2	11	0.0017	Treelet	.
Uapaca	*acuminata*	Phyllanthaceae	UAAC	6	0.0013	Emergent	L Gui
Uapaca	*staudtii*	Phyllanthaceae	UAST	1184	9.6957	Emergent	L Gui
Urobotrya	*congolana*	Opiliaceae	EULI	23	0.0103	Treelet	Gui-Cong
Uvariastrum	*pynaertii*	Annonaceae	ANNS	446	1.5969	Understory	L Gui
Uvariodendron	sp.	Annonaceae	UOI	3248	6.5358	Understory	.
Uvariopsis	*bakeriana*	Annonaceae	UVBA	1630	0.732	Treelet	Nig-Cam
Uvariopsis	*congolana*	Annonaceae	UVCO	4	0.0051	Treelet	L Gui
Uvariopsis	*korupensis*	Annonaceae	UVAI	490	1.1131	Understory	Nig-Cam
Vernonia	*conferta*	Asteraceae	VECO	9	0.0276	Treelet	Gui-Cong
Vernonia	*frondosa*	Asteraceae	VERH	27	0.0611	Treelet	U&L Gui
Vitex	*grandifolia*	Lamiaceae	VIGR	181	5.9731	Canopy	U&L Gui
Vitex	sp. 1	Lamiaceae	VIT2	77	17.5556	Emergent	.
Vitex	sp. 2	Lamiaceae	VIT3	1	1e-04	Emergent	.
Vitex	sp. 3	Lamiaceae	VITI	135	7.6492	Emergent	.
Vitex	sp. 5	Lamiaceae	VITV	18	0.0134	Treelet	.
Vitex	sp. 6	Lamiaceae	VITP	59	0.3192	Canopy	.

Appendix 1 continued

Genus	Species	Family	Code	*N*	*BA*	Form	Range
Voacanga	*psilocalyx*	Apocynaceae	VOAI	299	0.0583	Treelet	L Gui
Warneckea	*jasminoides*	Melastomataceae	WAR2	199	0.6043	Understory	L Gui-Cong
Warneckea	*membranifolia*	Melastomataceae	WAME	1857	1.3283	Treelet	U&L Gui
Warneckea	*pulcherrima*	Melastomataceae	WARI	240	1.57	Understory	L Gui
Xylopia	*acutiflora*	Annonaceae	XYAC	245	0.6578	Understory	Gui-Cong
Xylopia	*aethiopica*	Annonaceae	XYAE	217	8.9498	Canopy	Gui-Cong
Xylopia	sp. 1	Annonaceae	UVAR	55	0.4442	Canopy	.
Xylopia	sp. 2	Annonaceae	XYLO	3	0.1841	Canopy	.
Xylopia	*villosa*	Annonaceae	XYVI	23	0.4367	Canopy	U&L Gui
Zanthoxylum	*gilletii*	Rutaceae	ZATE	282	17.7113	Emergent	Africa
Zanthoxylum	sp. 1	Rutaceae	ZANG	3	0.0029	Understory	.
Zanthoxylum	sp. 2	Rutaceae	ZANH	9	0.0023	Treelet	.
Zanthoxylum	sp. 3	Rutaceae	ZATM	19	0.0092	Canopy	.
Zeyherella	*letestui*	Sapotaceae	ZELE	7	0.1578	Canopy	L Gui
.	.	Acanthaceae	ACA2	52	0.013	Treelet	.
.	.	Sapindaceae	ALEL	1	0.5027	Treelet	.
.	.	Annonaceae	ANN2	1	0.0015	Treelet	.
.	.	Annonaceae	ANNV	2	2e-04	Treelet	.
.	.	Rubiaceae	COF3	15	0.0025	Treelet	.
.	.	Rubiaceae	COF4	91	0.1399	Understory	.
.	.	Rubiaceae	COF5	4	0.0018	Treelet	.
.	.	Icacinaceae	EUP3	19	0.0068	Treelet	.
.	.	Fabaceae	FATD	2	9e-04	Treelet	.
.	.	.	FLAI	1	6e-04	Treelet	.
.	.	Rubiaceae	HRUB	1	2e-04	Treelet	.
.	.	Sapindaceae	LACS	7	0.0012	Treelet	.
.	.	Rubiaceae	LAS2	1	9e-04	Treelet	.
.	.	Fabaceae	LEG2	1	0.0177	Understory	.
.	.	Rubiaceae	MIT2	3	0.0345	Understory	.
.	.	Rubiaceae	MOKO	2	0.0685	Understory	.
.	.	Rubiaceae	NRUB	2	0.0016	Treelet	.
.	.	Ochnaceae	OURI	184	0.0734	Treelet	.
.	.	Rubiaceae	RUB3	1	1e-04	Treelet	.
.	.	Rubiaceae	RUB7	825	0.3924	Treelet	.
.	.	Rubiaceae	RUBB	109	0.0182	Treelet	.
.	.	Rubiaceae	RUBM	17	0.3779	Canopy	.
.	.	Rubiaceae	RUBS	144	0.1162	Treelet	.
.	.	Rubiaceae	RUBT3	32	0.1122	Treelet	.
.	.	Rubiaceae	RUBY	7	0.0101	Treelet	.
.	.	.	RUT3	6	0.0049	Treelet	.
.	.	Rubiaceae	RUTR	13	0.032	Treelet	.
.	.	Rubiaceae	RUTR2	4	0.022	Understory	.
.	.	Rubiaceae	RUYR	2	0.0177	Understory	.
.	.	Chrysobalanaceae	SOYA	65	0.6595	Canopy	.
.	.	.	UNID	680	6.4573	.	.
.	.	.	WDIG	11	0.0036	Treelet	.
.	.	Sapindaceae	WLOV	1	6e-04	Treelet	.

Species names with sp. indicate unnamed but recognizable morphospecies; those with sp. nov. are novel species which have not yet been described. The 4-letter code is our field designation, and is necessary here only for the unidentified species at the end of the table, which otherwise have no designation. All codes but one refer to single morphospecies; the exception, UNID, encompasses all individuals not assigned to one of the morphospecies. *N* = number of individuals ≥1 cm dbh in 50 ha. *BA* = basal area in m^2 per 50 ha. Range descriptions: Nig-Cam = SE Nigeria and SW Cameroon endemic; L Gui = Lower Guinea endemic; U&L Gui = Upper and Lower Guinea; L Gui-Cong = Lower Guinea-Congolian; Gui-Cong = Guineo-Congolian; Africa = Widespread in Africa. We omit authorities here, but refer instead to http://www.ctfs.si.edu/africatree, where more information is given for all the species

Appendix 2 Genera of the Korup 50-ha plot

Genus	Family	Species	*N*	*BA*
Afzelia	Fabaceae	2	85	5.8927
Aidia	Rubiaceae	1	33	0.2303
Albizia	Fabaceae	1	1	0.509
Allexis	Violaceae	1	883	1.2924
Allophylus	Sapindaceae	3	126	0.0269
Alsodeiopsis	Icacinaceae	1	16	0.0022
Alstonia	Apocynaceae	1	66	14.8402
Amphimas	Fabaceae	1	22	0.8963
Angylocalyx	Fabaceae	2	5858	3.9654
Anisophyllea	Anisophylleaceae	3	222	4.6431
Annickia	Annonaceae	1	707	8.3172
Anthocleista	Gentianaceae	2	59	3.633
Anthonotha	Fabaceae	4	419	11.9888
Antidesma	Phyllanthaceae	2	724	2.1656
Antrocaryon	Anacardiaceae	1	8	0.0091
Aoranthe	Rubiaceae	1	79	0.5942
Aporrhiza	Sapindaceae	1	171	0.6366
Araliopsis	Rutaceae	1	168	3.1839
Asystasia	Acanthaceae	1	8	0.0011
Aulacocalyx	Rubiaceae	3	2735	3.2458
Baikiaea	Fabaceae	1	20	0.0588
Baillonella	Sapotaceae	1	4	1.0854
Baphia	Fabaceae	3	2889	17.5033
Barteria	Passifloraceae	1	79	0.3336
Beilschmiedia	Lauraceae	7	3070	9.5052
Belonophora	Rubiaceae	2	2548	0.6971
Berlinia	Fabaceae	3	830	5.967
Bersama	Melianthaceae	1	9	0.0048
Bertiera	Rubiaceae	2	725	0.133
Blighia	Sapindaceae	1	20	0.4155
Brenania	Rubiaceae	1	10	0.0057
Bridelia	Phyllanthaceae	2	59	0.8391
Caloncoba	Salicaceae	1	88	6.6273
Calpocalyx	Fabaceae	1	3066	7.7904
Calycosiphonia	Rubiaceae	1	112	0.1034
Camptostylus	Achariaceae	1	143	0.3376
Campylospermum	Ochnaceae	4	1032	0.6505
Canthium	Rubiaceae	3	179	0.316
Carapa	Meliaceae	2	800	8.1519
Carpolobia	Polygalaceae	1	485	0.1245
Casearia	Salicaceae	1	80	0.3792
Cassipourea	Rhizophoraceae	1	47	0.1495
Ceiba	Malvaceae	1	2	0.0114
Cephaelis	Rubiaceae	1	10	0.004
Chrysobalanus	Chrysobalanaceae	1	62	0.4534
Chrysophyllum	Sapotaceae	2	193	0.6871
Chytranthus	Sapindaceae	4	482	0.537
Cleistanthus	Phyllanthaceae	1	43	0.2203
Cleistopholis	Annonaceae	2	49	2.389
Coelocaryon	Myristicaceae	1	87	5.3102
Coffea	Rubiaceae	1	1	2e-04
Cola	Malvaceae	23	70355	137.8057
Copaifera	Fabaceae	1	8	0.1553
Cordia	Boraginaceae	1	5	0.0482
Coula	Olacaceae	1	8	0.3554

Appendix 2 continued

Genus	Family	Species	*N*	*BA*
Crateranthus	Lecythidaceae	1	18	0.0246
Craterispermum	Rubiaceae	2	2684	2.7479
Croton	Euphorbiaceae	1	112	3.9922
Crotonogyne	Euphorbiaceae	1	3888	1.2752
Crotonogynopsis	Euphorbiaceae	1	2158	0.9347
Crudia	Fabaceae	1	1	0.2489
Dacryodes	Burseraceae	2	189	7.2913
Dactyladenia	Chrysobalanaceae	2	230	0.7042
Dasylepis	Achariaceae	1	2144	7.2305
Deinbollia	Sapindaceae	3	616	1.0159
Desbordesia	Irvingiaceae	1	85	25.0731
Dialium	Fabaceae	2	419	5.9826
Dichaetanthera	Melastomataceae	1	3	0.0213
Dichostemma	Euphorbiaceae	1	17255	78.804
Dicranolepis	Thymelaeaceae	2	11	0.1512
Didymosalpinx	Rubiaceae	1	470	0.5067
Dinophora	Melastomataceae	1	2	2e-04
Diogoa	Olacaceae	1	3220	12.4436
Diospyros	Ebenaceae	14	19143	57.2358
Discoclaoxylon	Euphorbiaceae	1	37	0.2272
Discoglypremna	Euphorbiaceae	1	167	6.7191
Dorstenia	Moraceae	1	10	0.001
Dracaena	Ruscaceae	5	242	0.1029
Drypetes	Putrangivaceae	6	7579	28.2436
Duboscia	Malvaceae	1	2	0.0012
Endodesmia	Clusiaceae	1	270	3.4477
Englerophytum	Sapotaceae	1	652	2.4754
Engomegoma	Olacaceae	1	1	0.5555
Entandrophragma	Meliaceae	1	44	0.0585
Eriocoelum	Sapindaceae	1	76	1.5052
Erismadelphus	Vochysiaceae	1	251	13.7765
Erythrina	Fabaceae	1	8	0.1152
Erythrophleum	Fabaceae	1	79	24.5632
Erythroxylum	Rhizophoraceae	1	21	1.3316
Euclinia	Rubiaceae	1	131	0.0872
Eugenia	Myrtaceae	3	339	0.1591
Eurypetalum	Fabaceae	1	7	0.3198
Fagara	Rutaceae	1	109	2.7442
Ficus	Moraceae	1	3	0.0773
Funtumia	Apocynaceae	1	11	0.2239
Gaertnera	Rubiaceae	2	721	0.1585
Garcinia	Clusiaceae	10	2828	14.3676
Gilbertiodendron	Fabaceae	1	288	2.0869
Glossocalyx	Monimiaceae	1	1070	0.8259
Glyphaea	Malvaceae	1	14	0.0091
Guarea	Meliaceae	3	149	7.8527
Hallea	Rubiaceae	1	69	5.5641
Heckeldora	Meliaceae	1	6	8e-04
Heinsia	Rubiaceae	1	103	0.359
Heisteria	Olacaceae	1	1174	0.1943
Homalium	Salicaceae	4	1287	15.0165
Hoplestigma	Hoplestigmataceae	1	19	0.3611
Hunteria	Apocynaceae	1	874	8.462
Hylodendron	Fabaceae	1	13	1.9989
Hymenostegia	Fabaceae	3	4279	36.5872

Appendix 2 continued

Genus	Family	Species	*N*	*BA*
Hypodaphnis	Lauraceae	1	299	16.026
Irvingia	Irvingiaceae	3	150	11.4019
Isolona	Annonaceae	2	342	1.3131
Ixora	Rubiaceae	2	1998	0.4947
Jollydora	Connaraceae	2	1168	0.6919
Keayodendron	Euphorbiaceae	1	2	0.3641
Kigelia	Bignoniaceae	1	8	0.0345
Klaineanthus	Euphorbiaceae	1	2032	30.8603
Klainedoxa	Irvingiaceae	2	15	5.4233
Korupodendron	Vochysiaceae	1	16	2.1417
Laccodiscus	Sapindaceae	2	531	0.3037
Lannea	Anacardiaceae	1	16	0.0728
Lasianthera	Icacinaceae	1	792	0.508
Lasianthus	Rubiaceae	1	5	5e-04
Lasiodiscus	Rhamnaceae	1	164	0.0798
Lecomtedoxa	Sapotaceae	1	303	99.2725
Lepidobotrys	Lepidobotryaceae	1	11	1.6955
Leptaulus	Icacinaceae	2	475	4.9052
Leptonychia	Malvaceae	2	1537	0.5422
Licania	Chrysobalanaceae	1	2	0.3063
Lophira	Ochnaceae	1	39	9.8259
Macaranga	Euphorbiaceae	1	199	1.9403
Maesobotrya	Phyllanthaceae	3	3650	6.3719
Maesopsis	Rhamnaceae	1	52	2.1183
Magnistipula	Chrysobalanaceae	3	181	2.2775
Mammea	Clusiaceae	1	56	0.8646
Manilkara	Sapotaceae	1	1	4e-04
Maprounea	Euphorbiaceae	1	69	1.9353
Maranthes	Chrysobalanaceae	1	30	0.3989
Mareya	Euphorbiaceae	1	19	0.1905
Mareyopsis	Euphorbiaceae	1	464	0.9861
Margaritaria	Phyllanthaceae	1	17	0.9885
Massularia	Rubiaceae	1	2844	2.7275
Memecylon	Memecylaceae	6	1516	2.1107
Microcos	Malvaceae	1	198	3.4558
Microdesmis	Pandaceae	1	823	0.1854
Monodora	Annonaceae	1	21	0.5919
Morelia	Rubiaceae	1	54	0.2499
Morinda	Rubiaceae	1	10	0.3351
Mostuea	Gelsemiaceae	1	64	0.0072
Musanga	Urticaceae	1	169	5.7304
Mussaenda	Rubiaceae	1	1	0.0001
Napoleonaea	Lecythidaceae	3	167	0.184
Nauclea	Rubiaceae	2	26	6.6065
Newtonia	Fabaceae	2	117	2.0261
Nichallea	Rubiaceae	1	30	0.0079
Octoknema	Olacaceae	1	256	2.4398
Olax	Olacaceae	2	118	0.0149
Omphalocarpum	Sapotaceae	1	16	0.9482
Opilia	Opiliaceae	1	4	0.0014
Oricia	Rutaceae	2	102	0.0696
Ormocarpum	Fabaceae	1	10	0.0016
Oubanguia	Lecythidaceae	2	15025	218.8513
Ouratea	Ochnaceae	1	13	0.0132
Oxyanthus	Rubiaceae	2	131	0.0582

Appendix 2 continued

Genus	Family	Species	*N*	*BA*
Pachypodanthium	Annonaceae	2	181	1.2237
Panda	Pandaceae	1	35	1.59
Pauridiantha	Rubiaceae	3	349	1.5395
Pausinystalia	Rubiaceae	1	447	5.5646
Pavetta	Rubiaceae	3	132	0.0377
Pentadesma	Clusiaceae	2	96	4.5534
Petitiocodon	Rubiaceae	1	125	0.0615
Phyllanthus	Phyllanthaceae	1	9	0.114
Phyllobotryon	Salicaceae	2	26749	12.2895
Pierreodendron	Simaroubaceae	1	7	0.5472
Piptadeniastrum	Fabaceae	1	21	3.4182
Piptostigma	Annonaceae	1	1032	3.6617
Placodiscus	Sapindaceae	1	1290	2.0654
Pleiocarpa	Apocynaceae	2	488	0.191
Poga	Anisophylleaceae	1	11	13.4212
Polyceratocarpus	Annonaceae	1	2048	2.9843
Polysphaeria	Rubiaceae	1	737	0.3906
Protomegabaria	Phyllanthaceae	1	3375	73.2105
Pseudospondias	Anacardiaceae	1	60	2.3765
Psilanthus	Rubiaceae	1	75	0.0112
Psorospermun	Clusiaceae	1	15	0.0039
Psychotria	Rubiaceae	11	1216	0.3455
Pterocarpus	Fabaceae	1	18	0.0183
Ptychopetalum	Olacaceae	1	243	0.9132
Pycnanthus	Myristicaceae	1	25	0.1101
Pycnocoma	Euphorbiaceae	1	1332	1.0179
Rauvolfia	Apocynaceae	3	220	4.2391
Rhabdophyllum	Ochnaceae	1	13	0.0043
Rhaptopetalum	Lecythidaceae	3	341	1.5651
Rinorea	Violaceae	13	30530	27.7907
Ritchiea	Brassicaceae	1	1	0.0001
Rothmannia	Rubiaceae	4	582	0.5455
Sacoglottis	Humiriaceae	1	2	1.1931
Salacia	Celastraceae	4	2410	0.9871
Santiria	Burseraceae	1	138	7.304
Sapium	Euphorbiaceae	1	64	3.0913
Scaphopetalum	Malvaceae	1	428	0.0631
Schumanniophyton	Rubiaceae	1	1425	0.3828
Scottellia	Achariaceae	1	599	11.5492
Scyphocephalium	Myristicaceae	1	4	0.0116
Scytopetalum	Lecythidaceae	1	200	6.6969
Sericanthe	Rubiaceae	1	30	0.0341
Sibangea	Putrangivaceae	1	713	0.4419
Sorindeia	Anacardiaceae	2	356	1.6081
Soyauxia	Medusandraceae	1	3182	16.7249
Spathodea	Bignoniaceae	1	1	0.0257
Staudtia	Myristicaceae	2	202	15.2941
Sterculia	Malvaceae	2	43	0.8642
Stipularia	Rubiaceae	1	78	0.0111
Strephonema	Combretaceae	1	146	14.217
Strombosia	Olacaceae	4	7876	64.9254
Strombosiopsis	Olacaceae	1	1763	23.0436
Strychnos	Loganiaceae	1	7	0.6695
Symphonia	Clusiaceae	1	805	1.463
Synsepallum	Sapotaceae	1	199	2.2383

Appendix 2 continued

Genus	Family	Species	*N*	*BA*
Syzygium	Myrtaceae	2	77	2.351
Tabernaemontana	Apocynaceae	2	4257	17.3905
Talbotiella	Fabaceae	1	924	10.6727
Tapura	Dichapetalaceae	1	418	11.2514
Tarenna	Rubiaceae	2	137	0.0776
Tetrapleura	Fabaceae	1	8	0.8596
Thecacoris	Phyllanthaceae	2	170	1.967
Treculia	Moraceae	3	242	1.5994
Tricalysia	Rubiaceae	2	638	0.2032
Trichilia	Meliaceae	2	417	1.6291
Trichoscypha	Anacardiaceae	10	4064	7.7526
Turraeanthus	Meliaceae	1	251	0.0563
Turreanthus	Meliaceae	1	11	0.0017
Uapaca	Phyllanthaceae	2	1190	9.697
Urobotrya	Opiliaceae	1	23	0.0103
Uvariastrum	Annonaceae	1	446	1.5969
Uvariodendron	Annonaceae	1	3248	6.5358
Uvariopsis	Annonaceae	3	2124	1.8502
Vernonia	Asteraceae	2	36	0.0887
Vitex	Lamiaceae	6	471	31.5106
Voacanga	Apocynaceae	1	299	0.0583
Warneckea	Melastomataceae	3	2296	3.5026
Xylopia	Annonaceae	5	543	10.6726
Zanthoxylum	Rutaceae	4	313	17.7257
Zeyherella	Sapotaceae	1	7	0.1578

N = number of individuals ≥1 cm dbh in 50 ha. *BA* = basal area in m^2 per 50 ha

Appendix 3 Families of the Korup 50-ha plot

Family	Genera	Species	*N*	*BA*
Acanthaceae	1	2	60	0.0141
Achariaceae	3	3	2886	19.1173
Anacardiaceae	5	15	4504	11.8191
Anisophylleaceae	2	4	233	18.0643
Annonaceae	11	22	10744	41.1381
Apocynaceae	7	11	6215	45.405
Asteraceae	1	2	36	0.0887
Bignoniaceae	2	2	9	0.0602
Boraginaceae	1	1	5	0.0482
Brassicaceae	1	1	1	0.0001
Burseraceae	2	3	327	14.5953
Celastraceae	1	4	2410	0.9871
Chrysobalanaceae	5	9	570	4.7998
Clusiaceae	6	16	4070	24.7002
Combretaceae	1	1	146	14.2170
Connaraceae	1	2	1168	0.6919
Dichapetalaceae	1	1	418	11.2514
Ebenaceae	1	14	19143	57.2358
Euphorbiaceae	14	14	27798	132.3382
Fabaceae	24	39	19393	143.6448
Gelsemiaceae	1	1	64	0.0072
Gentianaceae	1	2	59	3.6330

Appendix 3 continued

Family	Genera	Species	*N*	*BA*
Hoplestigmataceae	1	1	19	0.3611
Humiriaceae	1	1	2	1.1931
Icacinaceae	3	5	1302	5.4222
Irvingiaceae	3	6	250	41.8983
Lamiaceae	1	6	471	31.5106
Lauraceae	2	8	3369	25.5312
Lecythidaceae	5	10	15751	227.3219
Lepidobotryaceae	1	1	11	1.6955
Loganiaceae	1	1	7	0.6695
Malvaceae	8	32	72579	142.7527
Medusandraceae	1	1	3182	16.7249
Melastomataceae	3	5	2301	3.5241
Meliaceae	7	11	1678	17.7510
Melianthaceae	1	1	9	0.0048
Memecylaceae	1	6	1516	2.1107
Monimiaceae	1	1	1070	0.8259
Moraceae	3	5	255	1.6777
Myristicaceae	4	5	318	20.726
Myrtaceae	2	5	416	2.5101
Ochnaceae	4	8	1281	10.5673
Olacaceae	9	13	14659	104.8857
Opiliaceae	2	2	27	0.0117
Pandaceae	2	2	858	1.7754
Passifloraceae	1	1	79	0.3336
Phyllanthaceae	9	16	9237	95.5739
Polygalaceae	1	1	485	0.1245
Putrangivaceae	2	7	8292	28.6855
Rhamnaceae	2	2	216	2.1981
Rhizophoraceae	2	2	68	1.4811
Rubiaceae	38	86	22953	35.7871
Ruscaceae	1	5	242	0.1029
Rutaceae	4	8	692	23.7234
Salicaceae	4	9	28204	34.3125
Sapindaceae	8	19	3321	7.0107
Sapotaceae	8	9	1375	106.8651
Simaroubaceae	1	1	7	0.5472
Thymelaeaceae	1	2	11	0.1512
Urticaceae	1	1	169	5.7304
Violaceae	2	14	31413	29.0831
Vochysiaceae	2	2	267	15.9182

N = number of individuals ≥1 cm dbh in 50 ha. *BA* = basal area in m^2 per 50 ha

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