

DAVIS EXPEDITION FUND
REPORT ON EXPEDITION / PROJECT

Expedition/Project Title: Botanical inventory of Nouabalé-Ndoki National Park

Travel Dates: 1 June - 31 August 2011

Location: Republic of Congo

Group Members: Sydney

Aims: Collecting and identifying plant specimens from
Nouabalé-Ndoki; Training local people in collecting
plants.

Outcome (not less than 300 words):-

Report on a botanical inventory of Nouabalé-Ndoki National Park,
Republic of Congo

Field mission carried out from 1 June to 31 August 2011



By Sydney Ndolo Ebika
November 2011

Introduction

The forest of the Republic of Congo is part of the Congo Basin forest which is recognized worldwide for its high biodiversity in flora and fauna and as the second largest dense tropical rainforest after Amazonia (Devers, 2006). Some areas of this forest have been studied due to the importance of large mammals. Based on the ecological value documented, a complex of protected areas was established. In 2002, for example, The Sangha-Trinational landscape (STN) was created and was recognized as an important area for conservation (CARPE, 2005). The STN landscape consists of three adjacent national parks in three different countries (Lobéké, Cameroon; Dzanga-Ndoki, Central Africa Republic and Nouabalé-Ndoki, Republic of Congo). On the Republic of Congo side, the Nouabalé-Ndoki National Park was proposed by UNESCO for consideration as World Heritage due to its high biodiversity (White et Vande weghe, 2008). Past botanical surveys have assisted in documenting the importance of the flora in the park but most of these surveys indicated more collecting was necessary (Ndolo Ebika, 2010; Brueur-Ndoundou, 2009; Kami et al., 2009; Harris & Wortley, 2008, Harris, 2002; Hall et al., 2002; Moutsamboté et al., 1994).

Despite intensive surveys in the past, the botanical richness of the Congo Basin in general and the Republic of Congo in particular is poorly known. One of the main factors holding back botany in Congo is the lack of a formal Flora Guide to the plants of this country. In addition, there are few trained Congolese in botanical studies.

By collecting and identifying 214 specimens from 2006-2008 in one protected area, Nouabalé-Ndoki National Park, which was intensively studied from 1988-2002, I found 29 new records for the park (Ndolo Ebika, 2010). This result led me to continue my botanical investigations in this protected area.

The 29 new records show that more botanical studies in the Republic of Congo in general and the Nouabalé-Ndoki National Park in particular, will increase our understanding of plant diversity.

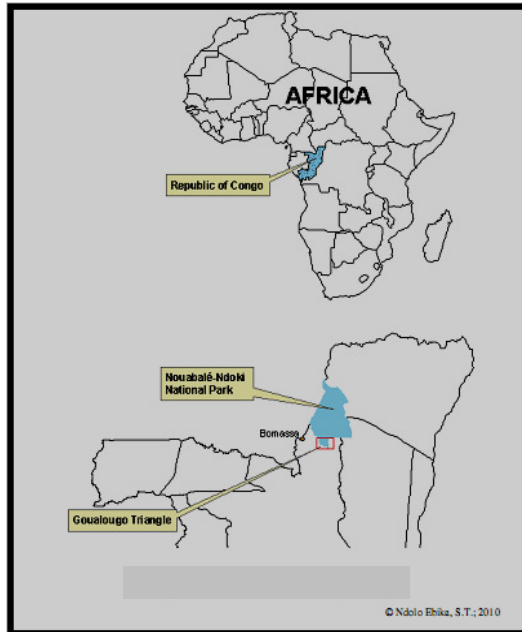
From the 1st June to the 31st September 2011 I carried out botanical inventories by means of plots sampling and general herbarium collection. 20 plots of 50 x 50 m each were surveyed. There were 40 families, 91 genera and 130 species accounting for 3358 individuals (3017 herbaceous plants and 341 trees). In total, 124 specimens were collected using the two methods but the vast majority of samples obtained were from outside plots.

Study area

The Nouabalé-Ndoki National Park is located in the northern Congo (see map 1) and has two adjacent national parks: Lobéké in Cameroon and Dzanga-Ndoki in Central African Republic. The three parks make the Sangha-Trinational landscape (STN); see map 2.

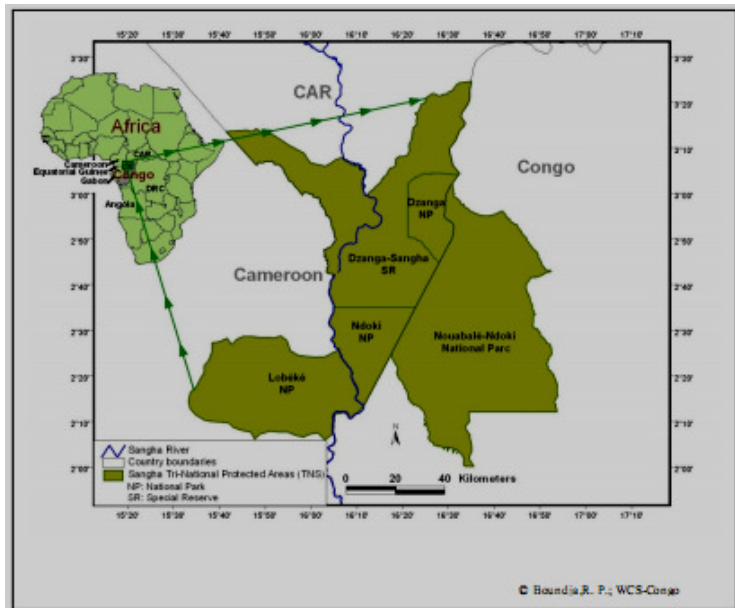
The park covers an area of 420.000 ha consisting on three main types of vegetation: mixed species forest, monodominant *Gilbertiodendron dewevrei* forest (on terra firma and seasonally flooded) and swamp forest.

For this field work, the botanical inventories were mainly done in the southern part of the Park, particularly in the Goulougo Triangle area shown on map 1.



Map1. Location of the Nouabalé-Ndoki National

Map2. Sangha-Trinational Landscape



Equipment used

The equipment we used during this field work are shown on the below picture.



A



B

Picture1. Equipment for botanical inventory

A: 1. Hammer, 2. Secateur, 3. GPS, 4. Compass, 5. Field book, 6. Pencil, 7. Hand lens, 8. Binoculars, 9. DBH meter (5 m), 10. String, 11. 50 m measuring tape

B: Press made up of: Frame, Strap, Felt, Newspaper, ventilator

Research Method

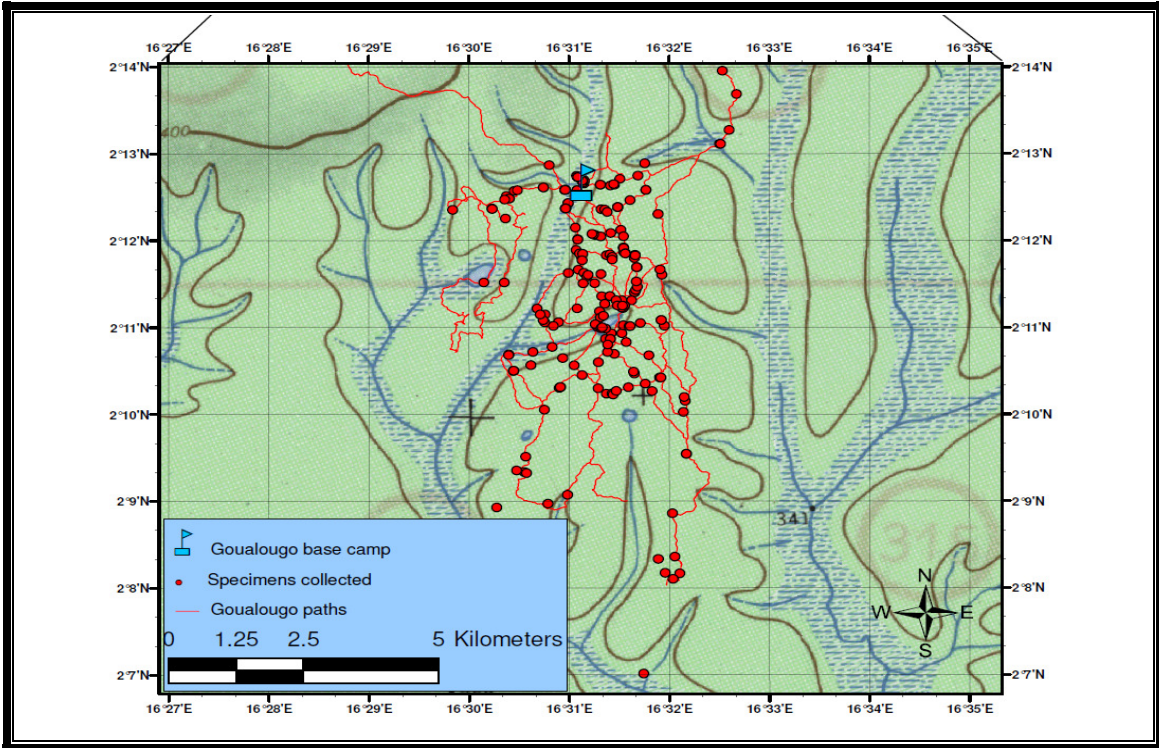
The fieldwork was carried out in the study area of the Goulougo Triangle Apes Project. The importance of accurately identifying plant species used by gorillas and chimpanzee cannot be underestimated. Without such information it is very difficult to estimate the importance of particular plant species in the apes diet or habitat preferences. For these reasons, botanical surveys were conducted in several habitat types (logged and unlogged).

Two ways of collecting plants information were used: general herbarium collections and plot sampling method.

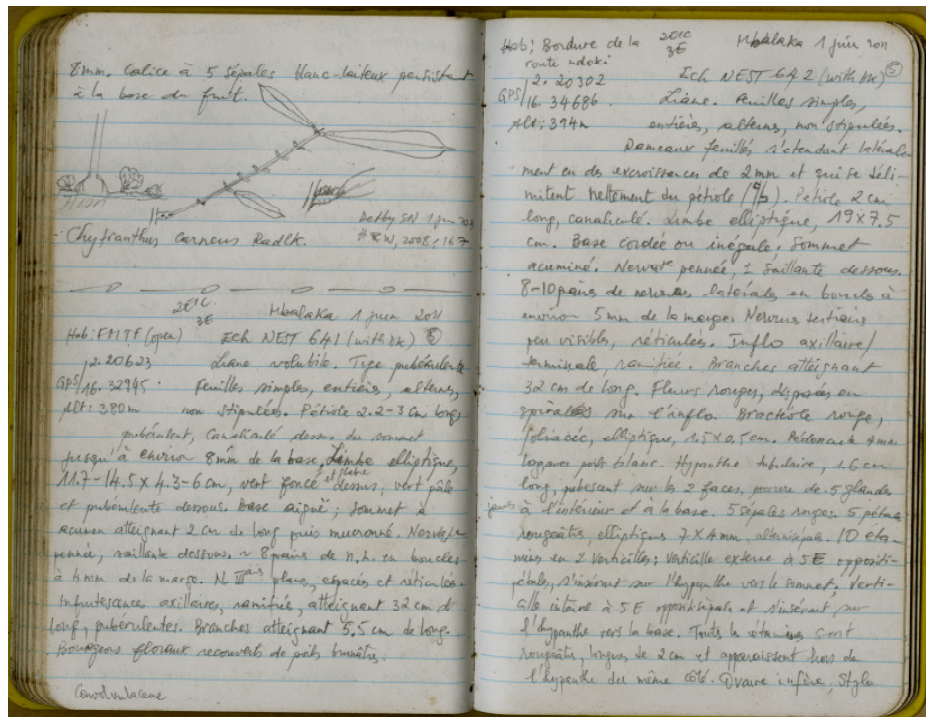
General herbarium collections

General herbarium collections are those made when walking in the forest (see map3). In some instances, particular species may be rare in the environment and collection of plants along trails outside of the botanical plots allowed us to expand our collection opportunities. For instance, the plots we did were mainly on mixed species forest and monodominant *Gilbertiodendron dewevrei* forest. In addition to those habitats covered by plots, specimens were also collected in swamp, forest alongside streams, wet places, road sides and in clearings “Yangas” in the forest.

Emphasis was placed on collecting plants either in flower or fruit production or both because this material will be especially useful during the identification process and for future taxonomic studies. Careful notes were made at the time of collecting each specimen. These field notes are: date of collection; collector’s name & collection number; GPS point (latitude and longitude); altitude (m); plant description; habitat; location (see picture 1). Specimens collected were dried on the same day. For each specimens collected, five duplicates were made and will be sent to different herbaria.



Map3. Specimens collecting for general herbarium purposes



Picture 2. Field notes

Plots sampling method

Plots were randomly placed in each habitat used by chimpanzees and gorillas.

The total size of a plot was 50 x 50 m. Trees with different dbh size were recorded in different subdivisions of the plot.

Step 1 (see Fig.1): From a starting point **A**, a 50 m long transect is traced and the plot is divided into two halves. This forms the line **A-B**, made by a cord. From **B**, we perpendicularly (90°) traced a 25 m line **B-C**. Then, another 50 m transect is opened from the point **C** forming **C-D** line. From **D** end, a 25 m transect will be traced to reach the starting point **A** and making the line **D-A**. Thus, a 50 x 25 m rectangle is traced. In this half plot, all trees of $DBH \geq 80$ cm and strangler figs of $DBH \geq 10$ cm are recorded.

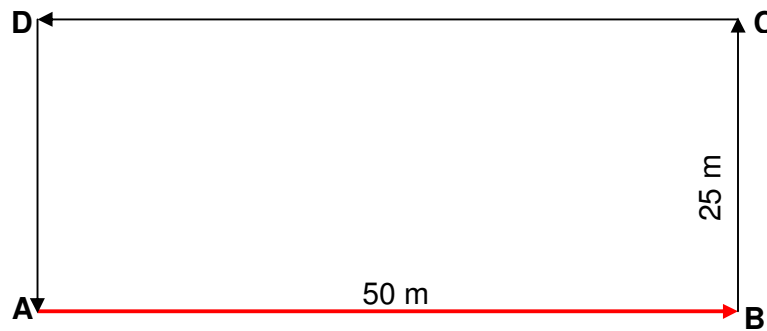


Figure 1: A 50 x 25 m plot

Step 2 (cf Fig.2): After recording the above data in the 50 x 25 m, we further subdivided the half plot into half. As result, a 50 x 12.5 m plot is obtained and only trees with $30 < DBH < 80$ cm are recorded.

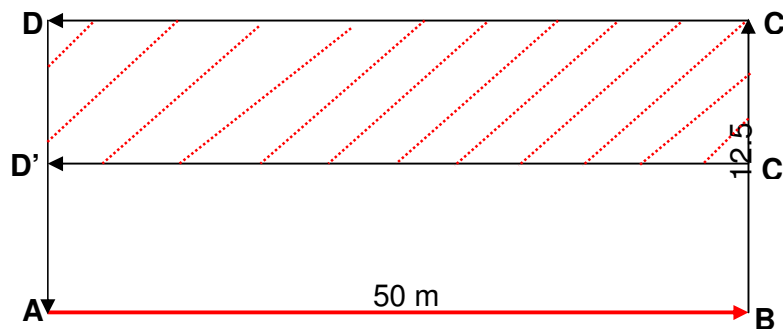


Figure 2: A 50 x 12.5 m plot

Step 3 (cf Fig.3): The last step in the first half plot (50 x 25 m) is to furthermore divide it to have a 50 x 2.5 m plot. Trees with $10 < \text{DBH} \leq 30$ cm are recorded and all stems of herbaceous plants belonging to the Commelinaceae, Marantaceae and Zingiberaceae are counted.

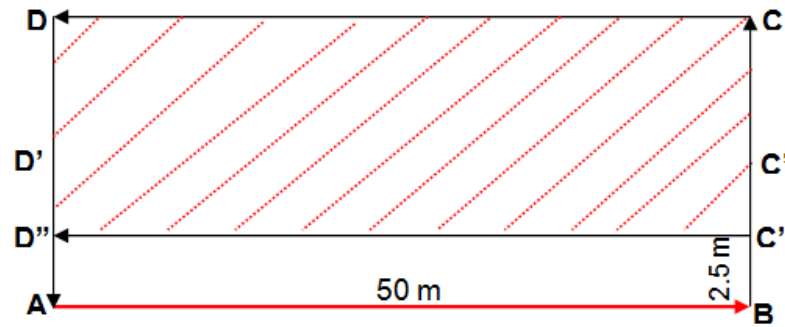


Figure 3: A 50 x 2.5 m plot

Once data recording is finished in the 50 x 2.5 m plot, we repeated the steps 1-3 for the second half (50 x 25 cm) in order to form the rectangles **ABFE**, **ABF'E'** and **ABF''E''**.

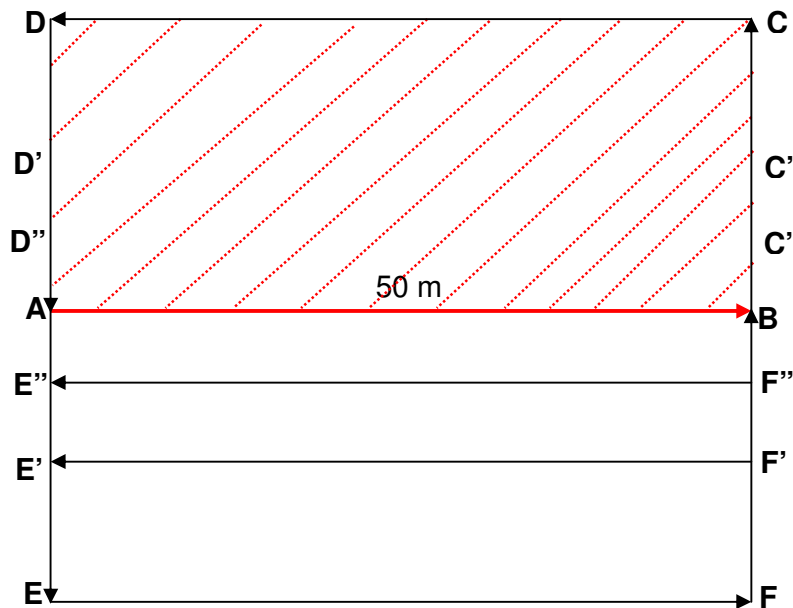


Figure 4: An overview of the entire plot 50 x 50 m.

Results

In total, 20 plots each measuring 50 x 50 m were measured during the three months. There were 40 families, 91 genera and 130 species accounting for 3358 individuals (3017 herbaceous plants and 341 trees). The table 1 shows the most speciose families (at least six species). The table 2 gives the list of species recorded in the twenty plots as well as the family and the number of individuals for each of them.

Family	Number of Species
Leguminosae	11
Sapotaceae	7
Euphorbiaceae	7
Marantaceae	7
Sapindaceae	7
Annonaceae	6
Meliaceae	6
Malvaceae	6

Table 1: The eight families with the most species

Family	Scientific name	Habit	Number of individuals
Achariaceae	<i>Caloncoba welwitschii</i>	Tree	4
Achariaceae	<i>Lindackeria dentata</i>	Tree	1
Achariaceae	<i>Scottellia klaineana</i>	Tree	4
Annonaceae	<i>Anonidium mannii</i>	Tree	5
Annonaceae	<i>Cleistopholis patens</i>	Tree	2
Annonaceae	<i>Greenwayodendron suaveolens</i>	Tree	13
Annonaceae	<i>Hexalobus sp.</i>	Tree	3
Annonaceae	<i>Isolona hexaloba</i>	Tree	3
Annonaceae	<i>Uvariastrum germainii</i>	Tree	1
Annonaceae	<i>Xylopia hypolampra</i>	Tree	3
Annonaceae	<i>Xylopia spp.</i>	Tree	2
Apocynaceae	<i>Alstonia boonei</i>	Tree	1
Apocynaceae	<i>Funtumia elastica</i>	Tree	4
Apocynaceae	<i>Tabernaemontana penduliflora</i>	Tree	2
Bignoniaceae	<i>Fernandoa adolfi-friderici</i>	Tree	1
Burseraceae	<i>Santiria trimera</i>	Tree	3

Family	Scientific name	Genus	Number of individuals
Cannabaceae	<i>Celtis adolfi-friderici</i>	Tree	4
Cannabaceae	<i>Celtis mildbraedii</i>	Tree	23
Cannabaceae	<i>Celtis philippensis</i>	Tree	2
Clusiaceae	<i>Allanblackia floribunda</i>	Tree	1
Combretaceae	<i>Pteleopsis hylodendron</i>	Tree	2
Combretaceae	<i>Terminalia superba</i>	Tree	4
Commelinaceae	<i>Palisota ambigua</i>	Herb	492
Commelinaceae	<i>Palisota brachythyrso</i>	Herb	591
Commelinaceae	<i>Palisota</i>	Herb	11
Commelinaceae	<i>Palisota thollonii</i>	Herb	11
Ebenaceae	<i>Diospyros bipindensis</i>	Tree	7
Ebenaceae	<i>Diospyros canaliculata</i>	Tree	5
Ebenaceae	<i>Diospyros crassiflora</i>	Tree	3
Ebenaceae	<i>Diospyros iturensis</i>	Tree	5
Euphorbiaceae	<i>Dichostemma glaucescens</i>	Tree	14
Euphorbiaceae	<i>Discoglyprena caloneura</i>	Tree	3
Euphorbiaceae	<i>Elaeophorbium grandifolia</i>	Tree	1
Euphorbiaceae	<i>Grossera macrantha</i>	Tree	5
Euphorbiaceae	<i>Macaranga barteri</i>	Tree	4
Euphorbiaceae	<i>Macaranga spinosa</i>	Tree	1
Euphorbiaceae	<i>Plagiostyles africana</i>	Tree	4
Huaceae	<i>Afrostryax lepidophyllus</i>	Tree	2
Irvingiaceae	<i>Irvingia excelsa</i>	Tree	1
Irvingiaceae	<i>Irvingia grandifolia</i>	Tree	1
Irvingiaceae	<i>Klainedoxa gabonensis</i>	Tree	2
Ixonanthaceae	<i>Phyllocosmus africanus</i>	Tree	1
Lamiaceae	<i>Vitex</i>	Tree	2
Lecythidaceae	<i>Petersianthus macrocarpus</i>	Tree	12
Leguminosae		Tree	2
Leguminosae- Caesalpinioideae	<i>Dialium pachyphyllum</i>	Tree	1
Leguminosae- Caesalpinioideae	<i>Dialium polyanthum</i>	Tree	1
Leguminosae- Caesalpinioideae	<i>Dialium</i>	Tree	1
Leguminosae- Caesalpinioideae	<i>Dialium zenkeri</i>	Tree	1

Family	Scientific name	Habit	Number of individuals
Leguminosae- Caesalpinioideae	<i>Erythrophleum suaveolens</i>	Tree	3
Leguminosae- Caesalpinioideae	<i>Gilbertiodendron dewevrei</i>	Tree	11
Leguminosae- Caesalpinioideae	<i>Oxystigma oxyphyllum</i>	Tree	2
Leguminosae- Caesalpinioideae	<i>Tessmannia africana</i>	Tree	2
Leguminosae- Mimosoideae	<i>Pentaclethra macrophylla</i>	Tree	1
Leguminosae- Papilionoideae	<i>Amphimas pterocarpoides</i>	Tree	2
Leguminosae- Papilionoideae	<i>Angylocalyx pynaertii</i>	Tree	1
Leguminosae- Papilionoideae	<i>Pterocarpus soyauxii</i>	Tree	7
Malvaceae	<i>Cola acuminata</i>	Tree	1
Malvaceae	<i>Cola lateritia</i>	Tree	5
Malvaceae	<i>Duboscia</i>	Tree	1
Malvaceae	<i>Nesogordonia kabingaensis</i>	Tree	7
Malvaceae	<i>Sterculia oblonga</i>	Tree	2
Malvaceae	<i>Sterculia tragacantha</i>	Tree	1
Malvaceae	<i>Triplochiton scleroxylon</i>	Tree	2
Marantaceae	<i>Ataenidia conferta</i>	Herb	186
Marantaceae	<i>Haumania danckelmaniana</i>	Herb	710
Marantaceae	<i>Hypselodelphys scandens</i>	Herb	22
Marantaceae	<i>Marantochloa congensis</i>	Herb	208
Marantaceae	<i>Megaphrynium macrostachyum</i>	Herb	30
Marantaceae	<i>Sarcophrynium schweinfurthianum</i>	Herb	247
Marantaceae	<i>Trachyphrynium braunianum</i>	Herb	16
Meliaceae	<i>Carapa procera</i>	Tree	1
Meliaceae	<i>Entandrophragma cylindricum</i>	Tree	4
Meliaceae	<i>Entandrophragma</i>	Tree	2
Meliaceae	<i>Guarea cedrata</i>	Tree	3
Meliaceae	<i>Guarea thompsonii</i>	Tree	1
Meliaceae	<i>Trichilia prieuriana</i>	Tree	1
Meliaceae	<i>Trichilia rubescens</i>	Tree	3

Family	Scientific name	Habit	Number of individuals
Meliaceae	<i>Trichilia</i>	Tree	2
Moraceae	<i>Ficus burretiana</i>	Hemi-epiphyte	1
Moraceae	<i>Milicia excelsa</i>	Tree	1
Myristicaceae	<i>Coelocaryon preussii</i>	Tree	1
Myristicaceae	<i>Pycnanthus angolensis</i>	Tree	3
Myristicaceae	<i>Staudtia kamerunensis</i>	Tree	2
Olacaceae	<i>Ongokea gore</i>	Tree	1
Olacaceae	<i>Strombosia grandifolia</i>	Tree	5
Olacaceae	<i>Strombosia nigropunctata</i>	Tree	4
Olacaceae	<i>Strombosia pustulata</i>	Tree	11
Olacaceae	<i>Strombosia</i>	Tree	4
Olacaceae	<i>Strombosiopsis tetrandra</i>	Tree	4
Pandaceae	<i>Panda oleosa</i>	Tree	3
Passifloraceae	<i>Barteria</i>	Tree	2
Phyllanthaceae	<i>Margaritaria discoidea</i>	Tree	1
Putranjivaceae	<i>Drypetes gossweileri</i>	Tree	3
Putranjivaceae	<i>Drypetes ituriensis</i>	Tree	1
Putranjivaceae	<i>Drypetes occidentalis</i>	Tree	3
Putranjivaceae	<i>Drypetes polyantha</i>	Tree	1
Putranjivaceae	<i>Drypetes</i>	Tree	1
Rubiaceae	<i>Pauridiantha</i>	Tree	1
Rubiaceae	<i>Pausinystalia macroceras</i>	Tree	4
Rubiaceae	<i>Psydrax</i>	Tree	1
Rubiaceae		Tree	3
Rutaceae	<i>Zanthoxylum</i>	Tree	4
Salicaceae	<i>Casearia barteri</i>	Tree	2
Sapindaceae	<i>Blighia welwitschii</i>	Tree	5
Sapindaceae	<i>Laccodiscus pseudostipularis</i>	Tree	1
Sapindaceae	<i>Lecaniodiscus cupanioides</i>	Tree	1
Sapindaceae	<i>Majidea fosteri</i>	Tree	2
Sapindaceae	<i>Pancovia harmsiana</i>	Tree	1
Sapindaceae	<i>Pancovia laurentii</i>	Tree	2
Sapindaceae	<i>Zanha golungensis</i>	Tree	1
Sapotaceae	<i>Aningeria robusta</i>	Tree	1
Sapotaceae	<i>Chrysophyllum beguei</i>	Tree	1
Sapotaceae	<i>Chrysophyllum boukokoense</i>	Tree	1
Sapotaceae	<i>Chrysophyllum lacourtianum</i>	Tree	1
Sapotaceae	<i>Chrysophyllum perpulchrum</i>	Tree	1

Family	Scientific name	Habit	Number of individuals
Sapotaceae	<i>Chrysophyllum pruniforme</i>	Tree	1
Sapotaceae	<i>Chrysophyllum</i>	Tree	1
Sapotaceae	<i>Omphalocarpum</i>	Tree	1
Sapotaceae	<i>Synsepalum longecuneatum</i>	Tree	3
Simaroubaceae	<i>Hannoa klaineana</i>	Tree	1
Thomandersiaceae	<i>Thomandersia hensii</i>	Tree	6
Unknown		Tree	6
Urticaceae	<i>Myrianthus arboreus</i>	Tree	1
Violaceae	<i>Rinorea oblongifolia</i>	Tree	1
Violaceae	<i>Rinorea</i>	Tree	1
Violaceae	<i>Rinorea welwitschii</i>	Tree	2
Zingiberaceae	<i>Aframomum melegueta</i>	Herb	1
Zingiberaceae	<i>Aframomum</i>	Herb	492

Table 2: List of species by family and number of individuals for each species in the twenty plots.

Specimens collected

Six plant categories were used to describe 124 specimens collected. Those categories are:

- *Hemi-epiphyte*: plant growing on another (host) without depending on the host for its nutrition
- *Herb*: non-woody and erected plants
- *Liana*: woody climbers
- *Shrub*: woody and erected plant less than 10 m high
- *Tree*: woody and erected plant greater than 10 m high
- *Vine*: all non-woody climbers/ twining plants

Most specimens were collected while walking along paths rather than during plot surveys. The number of specimens made from plots was 6 while by means of general collecting this number was 118. The number of specimens by plant category is shown on the table 3 below.

The list of specimens is provided in table 4 with the preliminary identification made at the time of collecting in the field.

Plant category	Number of specimens
Hemi-epiphyte	1
Tree	17
Vine	20
Liana	22
Herb	31
Shrub	33

Table 3: Number of specimens collected by category of plants.

Collector(s)	Number	Family	Genus	Species	Plant category	Habitat	Method
Ndolo Ebika, S.T.; Koni, D.	547	Rubiaceae			Shrub	Alongside roads	general
Ndolo Ebika, S.T.; Koni, D.	548	Melastomataceae	Dissotis	<i>Dissotis</i>	Herb	Alongside roads	general
Ndolo Ebika, S.T.; Koni, D.	549	Melastomataceae			Herb	Alongside roads	general
Ndolo Ebika, S.T.; Koni, D.	550	Solanaceae	Solanum	<i>Solanum</i>	Herb	Alongside roads	general
Ndolo Ebika, S.T.; Koni, D.	551	Leguminosae-Pap			Vine	Alongside roads	general
Ndolo Ebika, S.T.; Koni, D.	552	Euphorbiaceae	Dalechampia	<i>Dalechampia ipomoeifloia</i>	Vine	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	553	Lamiaceae	Clerodendrum	<i>Clerodendrum</i>	Liana	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	554	Rubiaceae	Rothmannia	<i>Rothmannia urcelliformis</i>	Tree	Terra firma	plot
Ndolo Ebika, S.T.; Koni, D.	555	Rubiaceae	Leptactina	<i>Leptactina pynaertii</i>	Shrub	Terra firma	plot
Ndolo Ebika, S.T.; Koni, D.	556	Passifloraceae	Adenia	<i>Adenia</i>	Vine	Alongside roads	general
Ndolo Ebika, S.T.; Koni, D.	557	Convolvulaceae	Ipomoea	<i>Ipomoea involucreata</i>	Vine	Alongside roads	general
Ndolo Ebika, S.T.; Koni, D.	558	Euphorbiaceae			Herb	Alongside roads	general
Ndolo Ebika, S.T.; Koni, D.	559	Euphorbiaceae	Plagiostyles	<i>Plagiostyles africana</i>	Tree	Terra firma	plot
Ndolo Ebika, S.T.; Koni, D.	560	Annonaceae	Monodora	<i>Monodora.</i>	Tree	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	561	Dioscoreaceae	Dioscorea	<i>Dioscorea</i>	Vine	Alongside roads	general
Ndolo Ebika, S.T.; Koni, D.	562	Leguminosae-Pap			Vine	Alongside roads	general
Ndolo Ebika, S.T.; Koni, D.	563	Leguminosae-Caesalp			Tree	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	564	Meliaceae	Khaya	<i>Khaya anthotheca</i>	Tree	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	565	Euphorbiaceae	Grossera	<i>Grossera macrantha</i>	Tree	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	566	Olacaceae	Strombosiopsis	<i>Strombosiopsis tetrandra</i>	Tree	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	567	Olacaceae	Heisteria	<i>Heisteria parvifolia</i>	Shrub	Stream (alongside)	general

Collector(s)	Number	Family	Genus	Species	Plant category	Habitat	Method
Ndolo Ebika, S.T.; Koni, D.	568	Commelinaceae	Palisota	<i>Palisota</i>	Herb	Terra firma	plot
Ndolo Ebika, S.T.; Koni, D.	569	Leguminosae- Caesalp	Tessmannia	<i>Tessmannia africana</i>	Tree	Terra firma	plot
Ndolo Ebika, S.T.; Koni, D.	570	Cyperaceae			Herb	Wet station	general
Ndolo Ebika, S.T.; Koni, D.	571				Herb	Wet station	general
Ndolo Ebika, S.T.; Koni, D.	572	Gramineae			Herb	Wet station	general
Ndolo Ebika, S.T.	573	Marantaceae	Marantochloa	<i>Marantochloa sp.</i>	Herb	Terra firma	general
Ndolo Ebika, S.T.	574	Commelinaceae	Palisota	<i>Palisota</i>	Herb	Terra firma	general
Ndolo Ebika, S.T.	575	Cucurbitaceae			Vine	Terra firma	general
Ndolo Ebika, S.T.	576	Euphorbiaceae			Shrub	Terra firma	general
Ndolo Ebika, S.T.	577	Lamiaceae			Liana	Terra firma	general
Ndolo Ebika, S.T.	578				Herb	Alongside roads	general
Ndolo Ebika, S.T.	579	Apocynaceae	Tabernanthe	<i>Tabernanthe iboga</i>	Shrub	Terra firma	general
Ndolo Ebika, S.T.	580	Cucurbitaceae			Vine	Terra firma	general
Ndolo Ebika, S.T.	581	Moraceae	Ficus	<i>Ficus ovata</i>	Hemi-epiphyte	Terra firma	general
Ndolo Ebika, S.T.	582	Leguminosae- Caesalp			Shrub	Terra firma	general
Ndolo Ebika, S.T.	583	Lamiaceae	Clerodendrum	<i>Clerodendrum</i>	Liana	Alongside roads	general
Ndolo Ebika, S.T.	584	Rubiaceae	Mussaenda	<i>Mussaenda</i>	Liana	River	general
Ndolo Ebika, S.T.	585	Ochnaceae	Campylospermum	<i>Campylospermum</i>	Shrub	River	general
Ndolo Ebika, S.T.	586	Rubiaceae	Stipularia	<i>Stipularia africana</i>	Shrub	River	general
Ndolo Ebika, S.T.	587	Rubiaceae			Vine	Terra firma	general
Ndolo Ebika, S.T.	588	Solanaceae	Solanum	<i>Solanum</i>	Herb	Terra firma	general

Collector(s)	Number	Family	Genus	Species	Plant category	Habitat	Method
Ndolo Ebika, S.T.; Koni, D.	589	Rubiaceae			Herb	Wet station	general
Ndolo Ebika, S.T.; Koni, D.	590	Euphorbiaceae	Discoglyprena	<i>Discoglyprena caloneura</i>	Tree	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	591	Irvingiaceae	Irvingia	<i>Irvingia grandifolia</i>	Tree	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	592	Pandaceae	Microdesmis	<i>Microdesmis puberula</i>	Shrub	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	593	Rubiaceae	Pauridiantha	<i>Pauridiantha</i>	Shrub	Terra firma	plot
Ndolo Ebika, S.T.; Koni, D.	594	Linaceae	Hugonia	<i>Hugonia</i>	Liana	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	595	Phyllanthaceae	Antidesma	<i>Antidesma laciniatum</i>	Shrub	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	596	Zingiberaceae	Aframomum	<i>Aframomum</i>	Herb	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	597	Zingiberaceae	Aframomum	<i>Aframomum</i>	Herb	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	598	Zingiberaceae	Aframomum	<i>Aframomum</i>	Herb	Swamp	general
Ndolo Ebika, S.T.; Koni, D.	599	Ebenaceae	Diospyros	<i>Diospyros iturensis</i>	Shrub	Gilbertiodendron dewevrei forest	general
Ndolo Ebika, S.T.; Koni, D.	600	Melastomataceae			Herb	Gilbertiodendron dewevrei forest	general
Ndolo Ebika, S.T.; Koni, D.	601	Menispermaceae	Jateorhiza	<i>Jateorhiza macrantha</i>	Vine	Terra firma	general
Ndolo Ebika, S.T.	602	Solanaceae	Solanum	<i>Solanum</i>	Vine	Terra firma	general
Ndolo Ebika, S.T.	603	Euphorbiaceae	Grossera	<i>Grossera macrantha</i>	Tree	Terra firma	general
Ndolo Ebika, S.T.	604	Marantaceae	Marantochloa	<i>Marantochloa</i>	Herb	Terra firma	general
Ndolo Ebika, S.T.	605	Cucurbitaceae			Vine	Terra firma	general
Ndolo Ebika, S.T.	606	Rhamnaceae	Lasiodiscus	<i>Lasiodiscus palustris</i>	Tree	Swamp	general
Ndolo Ebika, S.T.	607	Ebenaceae	Diospyros	<i>Diospyros ferrea</i>	Shrub	Swamp	general
Ndolo Ebika, S.T.; Koni, D.	608	Commelinaceae	Coleotrype	<i>Coleotrype laurentii</i>	Herb	Terra firma	general
Ndolo Ebika, S.T.	609	Menispermaceae			Liana	Terra firma	general

Collector(s)	Number	Family	Genus	Species	Plant category	Habitat	Method
Ndolo Ebika, S.T.; Koni, D.	610	Euphorbiaceae			Tree	Terra firma	general
Ndolo Ebika, S.T.	611	Commelinaceae	Palisota	<i>Palisota brachythyrsa</i>	Herb	Terra firma	general
Ndolo Ebika, S.T.	612	Commelinaceae	Palisota	<i>Palisota ambigua</i>	Herb	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	613	Passifloraceae	Adenia	<i>Adenia</i>	Vine	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	614	Sapindaceae	Allophylus	<i>Allophylus africanus</i>	Shrub	Terra firma	general
Ndolo Ebika, S.T.	615	Ruscaceae	Dracaena	<i>Dracaena phrynioides</i>	Herb	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	616	Cucurbitaceae			Vine	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	617	Convolvulaceae	Neuropeltis	<i>Neuropeltis</i>	Liana	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	618	Rubiaceae	Sherbournia	<i>Sherbournia curvipes</i>	Liana	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	619	Marantaceae	Hypselodelphys	<i>Hypselodelphys scandens</i>	Herb	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	620	Achariaceae	Buchnerodendron	<i>Buchnerodendron speciosum</i>	Shrub	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	621	Leguminosae-Mim			Liana	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	622	Rutaceae	Zanthoxylum	<i>Zanthoxylum gillettii</i>	Tree	Terra firma	general
Ndolo Ebika, S.T.	623	Hernandiaceae	Illigera	<i>Illigera pentaphylla</i>	Liana	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	624	Putranjivaceae	Drypetes	<i>Drypetes molunduana</i>	Shrub	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	625	Connaraceae	Agelaea	<i>Agelaea</i>	Liana	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	626	Simaroubaceae	Hannoa	<i>Hannoa klaineana</i>	Tree	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	627	Meliaceae	Turraea	<i>Turraea vogelii</i>	Liana	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	628	Cucurbitaceae			Vine	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	629	Menispermaceae			Vine	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	630	Lamiaceae			Herb	Alongside roads	general
Ndolo Ebika, S.T.; Koni, D.	631	Commelinaceae	Palisota	<i>Palisota sp.</i>	Herb	Terra firma	general

Collector(s)	Number	Family	Genus	Species	Plant category	Habitat	Method
Ndolo Ebika, S.T.; Koni, D.	632	Verbenaceae			Herb	Clearing	general
Ndolo Ebika, S.T.; Koni, D.	633	Cleomaceae	Cleome	<i>Cleome spinosa</i>	Herb	Clearing	general
Ndolo Ebika, S.T.; Koni, D.	634	Leguminosae-Pap			Shrub	Clearing	general
Ndolo Ebika, S.T.; Koni, D.	635	Malvaceae	Glyphaea	<i>Glyphaea brevis</i>	Shrub	Clearing	general
Ndolo Ebika, S.T.; Koni, D.	636	Leguminosae-Pap			Liana	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	637	Euphorbiaceae	Ricinodendron	<i>Ricinodendron heudelotii</i>	Tree	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	638	Zingiberaceae	Aframomum	<i>Aframomum</i>	Herb	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	639	Convolvulaceae			Liana	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	640	Sapindaceae	Chytranthus	<i>Chytranthus carneus</i>	Shrub	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	641	Convolvulaceae			Liana	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	642	Combretaceae	Combretum	<i>Combretum</i>	Liana	Alongside roads	general
Ndolo Ebika, S.T.; Koni, D.	643	Euphorbiaceae	Sclerocroton	<i>Sclerocroton cornutus</i>	Shrub	Alongside roads	general
Ndolo Ebika, S.T.; Koni, D.	644	Combretaceae	Combretum	<i>Combretum</i>	Liana	Alongside roads	general
Ndolo Ebika, S.T.	645	Annonaceae			Liana	Swamp	general
Ndolo Ebika, S.T.	646	Leguminosae-Pap	Millettia	<i>Millettia</i>	Liana	Swamp	general
Ndolo Ebika, S.T.	647	Acanthaceae	Justicia	<i>Justicia</i>	Herb	Swamp	general
Ndolo Ebika, S.T.	648	Putranjivaceae	Drypetes	<i>Drypetes bakembei</i>	Shrub	Swamp	general
Ndolo Ebika, S.T.	649	Violaceae	Rinorea	<i>Rinorea</i>	Shrub	Swamp	general
Ndolo Ebika, S.T.	650	Annonaceae			Liana	Swamp	general
Ndolo Ebika, S.T.	651	Euphorbiaceae	Dichostemma	<i>Dichostemma glaucescens</i>	Shrub	Swamp	general
Ndolo Ebika, S.T.	652	Passifloraceae	Adenia	<i>Adenia rumicifolia</i>	Vine	Terra firma	general
Ndolo Ebika, S.T.	653	Olacaceae	Aptandra	<i>Aptandra zenkeri</i>	Shrub	Terra firma	general

Collector(s)	Number	Family	Genus	Species	Plant category	Habitat	Method
Ndolo Ebika, S.T.	654	Lamiaceae	Vitex	<i>Vitex</i>	Tree	Terra firma	general
Ndolo Ebika, S.T.	655	Euphorbiaceae			Shrub	Terra firma	general
Ndolo Ebika, S.T.	656	Putranjivaceae	Drypetes	<i>Drypetes molunduana</i>	Shrub	Terra firma	general
Ndolo Ebika, S.T.	657	Putranjivaceae	Drypetes	<i>Drypetes</i>	Shrub	Terra firma	general
Ndolo Ebika, S.T.	658	Putranjivaceae	Drypetes	<i>Drypetes laciniata</i>	Shrub	Terra firma	general
Ndolo Ebika, S.T.	659	Annonaceae	Uvariopsis	<i>Uvariopsis solheidii</i>	Shrub	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	660	Salicaceae	Casearia	<i>Casearia congensis</i>	Shrub	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	661	Dioscoreaceae	Dioscorea	<i>Dioscorea bulbifera</i>	Vine	Terra firma	general
Ndolo Ebika, S.T.; Koni, D.	662	Apocynaceae	Rauvolfia	<i>Rauvolfia vomitoria</i>	Shrub	Terra firma	general
Ndolo Ebika, S.T.	663	Menispermaceae			Vine	Alongside roads	general
Ndolo Ebika, S.T.	664	Leguminosae- Caesalp			Herb	Alongside roads	general
Ndolo Ebika, S.T.	665	Rubiaceae			Herb	Alongside roads	general
Ndolo Ebika, S.T.	666	Leguminosae-Pap	Leptoderris	<i>Leptoderris hypargyra</i>	Liana	Alongside roads	general
Ndolo Ebika, S.T.	667	Euphorbiaceae	Macaranga	<i>Macaranga</i>	Shrub	Terra firma	general
Ndolo Ebika, S.T.	668	Loganiaceae	Strychnos	<i>Strychnos</i>	Liana	Terra firma	general
Ndolo Ebika, S.T.	669	Leguminosae-Pap			Vine	Terra firma	general
Ndolo Ebika, S.T.	670	Euphorbiaceae	Macaranga	<i>Macaranga monandra</i>	Shrub	Terra firma	general

Table 4: A detailed list of the 124 specimens. (*Koni Davy was my assistant during the fieldwork. His work is outlined in the next section*)

Species names linked to specimens in the above table are still tentative names for each specimen. Careful identification of the specimens are being done in two herbaria, Edinburgh (Royal Botanic Garden Edinburgh, UK) and herbarium Vandese (Wageningen University, Netherlands) to get accurate and confirmed names for the specimens. Images of some of the specimens listed above are shown on picture 3.



Picture 3: Photographs of six specimens collected during the fieldwork

In addition to the previous 29 new records for the Ndoki Region (Ndolo Ebika 2010), an additional 3 more species were recorded from the most recent surveys. These additional species were not only new to the Ndoki Region but were the first recordings of these species in the Republic of Congo. This shows how important it is to intensively survey the area and that the more we collect specimens in the area; the better will be our understanding of plant diversity in the Nouabalé-Ndoki National Park.

Training of local people

The work to be done in terms of collecting plants cannot be a matter of one botanist alone. It needs to be done in conjunction with others people who should be trained in basic knowledge of botany and collecting. Thus, during this field work two local people were trained. One was only trained in the use of navigation equipment (GPS and Compass) while the other, Davy Koni who was my assistant (see pictures 4 & 5), received training in both navigation and collecting. He did a great job and, for all specimens we collected together, he will be cited as co-collector.



Picture 4: Davy Koni pressing specimens



Picture 5: Davy Koni using a compass

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Sydney carrying specimens at the end of the fieldwork

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