The Biodiversity of Nkol Madouaka

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The biodiversity of Nkol Madouaka

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Missouri Botanical Garden
Gabon 2007

Prologue

Missouri Botanical Garden was awarded a Central African Regional Program for the Environment (CARPE) subcontract from the Conservation International (CI) to identify Biodiversity Sanctuaries (microzones) that complement the existing park system.

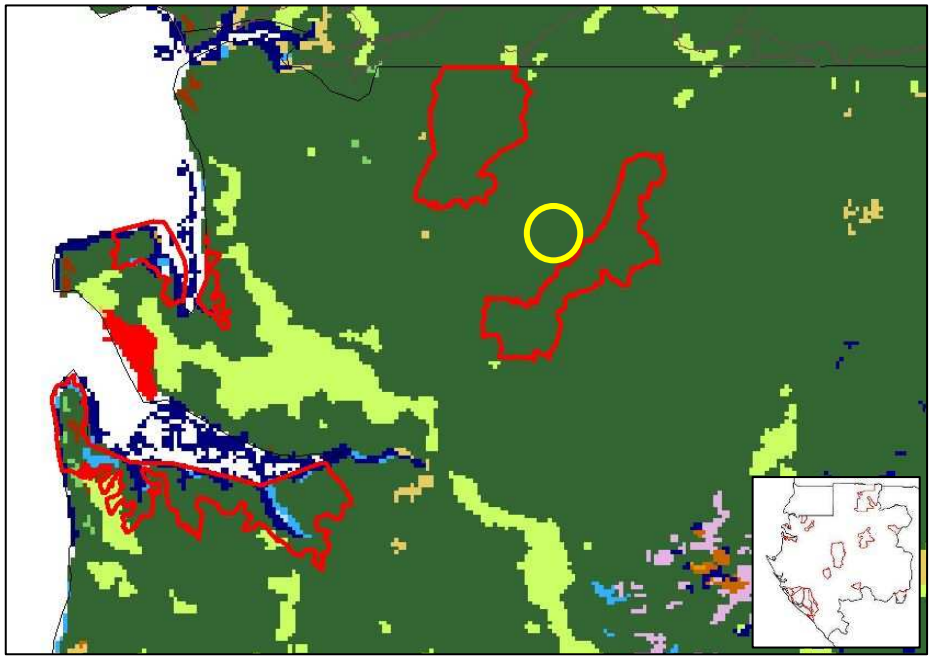
During this February Missouri Botanical Garden (MBG) has executed botanical activities in the Monts de Cristal landscape assessing the plant biodiversity of the Nkol Madouaka. The results and observations are presented here.

The author is a specialist in the Pleistocene Refuge Forest theory, vegetation-climate dynamics and the plant biodiversity of Gabon.

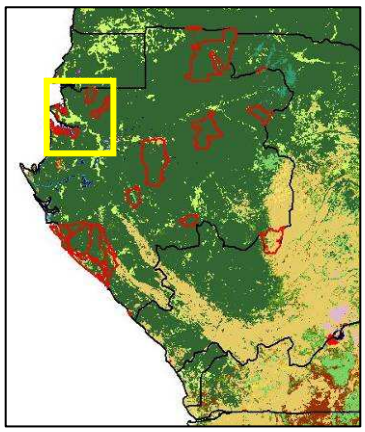
Miguel E. Leal

July 2007

The biodiversity of Nkol Madouaka



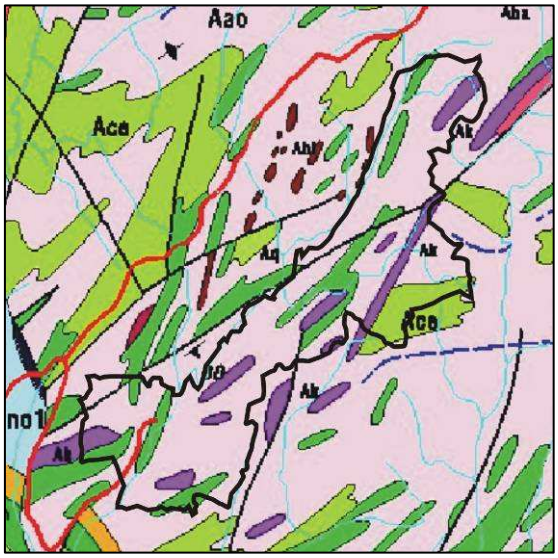
The vegetation of Monts de Cristal NP's (outlined in red) and the geographical position of the Nkol Madouaka (encircled in yellow).



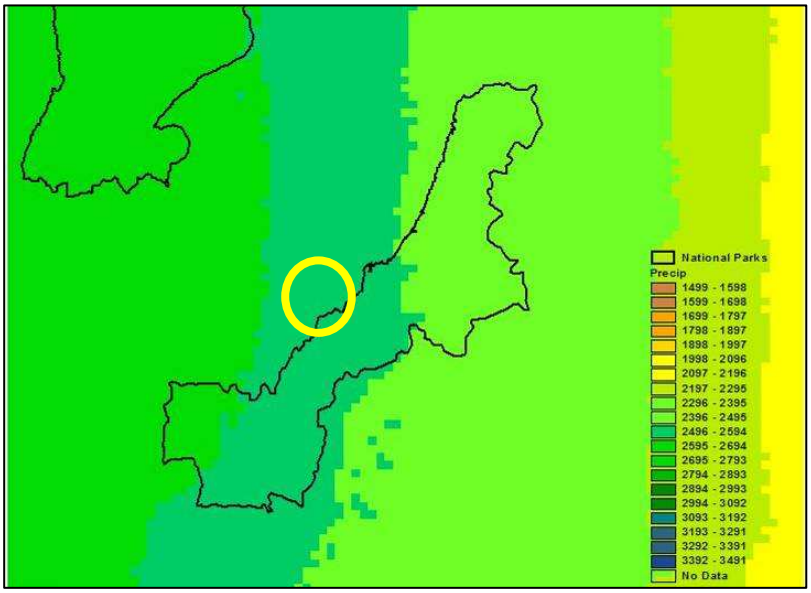
The forest cover in Gabon and Congo (dark green) and the flanking savannahs (light brown) source: Mayaux et al. 2003

The Monts de Cristal

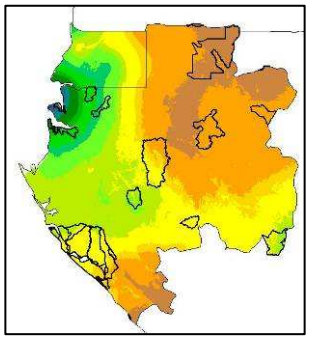
The Monts de Cristal are the dissected edge of the interior Woleu-Ntem Plateau. The abrupt transition between the coastal lowland and interior plateau makes them stick out as mountains, which they are not by altitude (all summits are below 1000m) but most certainly by ruggedness. The rock these hills are made of are older then life and once buried deep below high mountains. As over the eons these eroded away the Monts de Cristal rocks surfaced. They became even further uplifted when the African continent collided with Europe creating the Alps and Pyreneans in Europe and in Gabon the Monts de Cristal.



Geological formations around Mbé NP and the Tchimbelé area (incircled in red).



The National Parks (black outline) showing a rainfall gradient over the Plateaux from wet in the east to drier to the west.

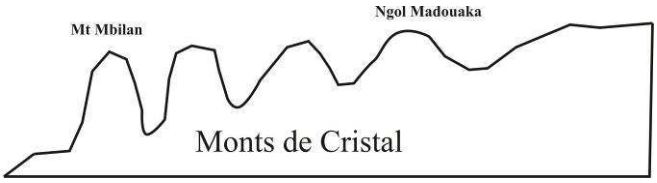


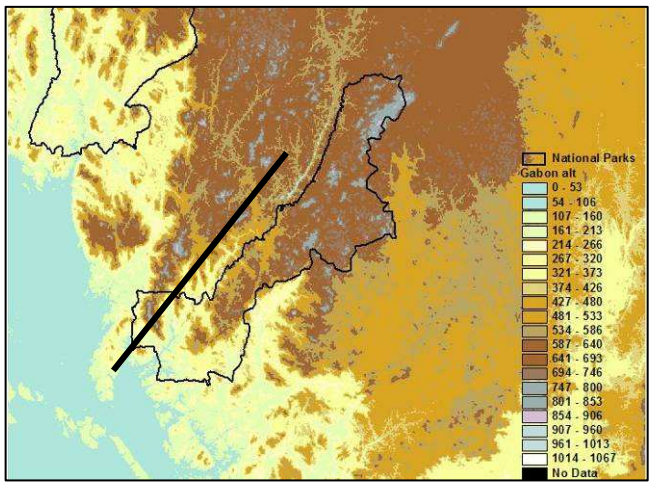
▲
Mean rainfall over Gabon, (gradient from blue-green-orange= wet to dry) showing that the SE is among the wetter parts of the country.

Now these hills are the canvas over which the oldest forest in Central Africa is spread. During ice ages in the Pleistocene, much of the Central African rain forest had made way for savannah as climate then was much drier than today. So, much of the present-day rain forest is not older than 10.000 years (the time since the last ice age) except in the Monts de Cristal.

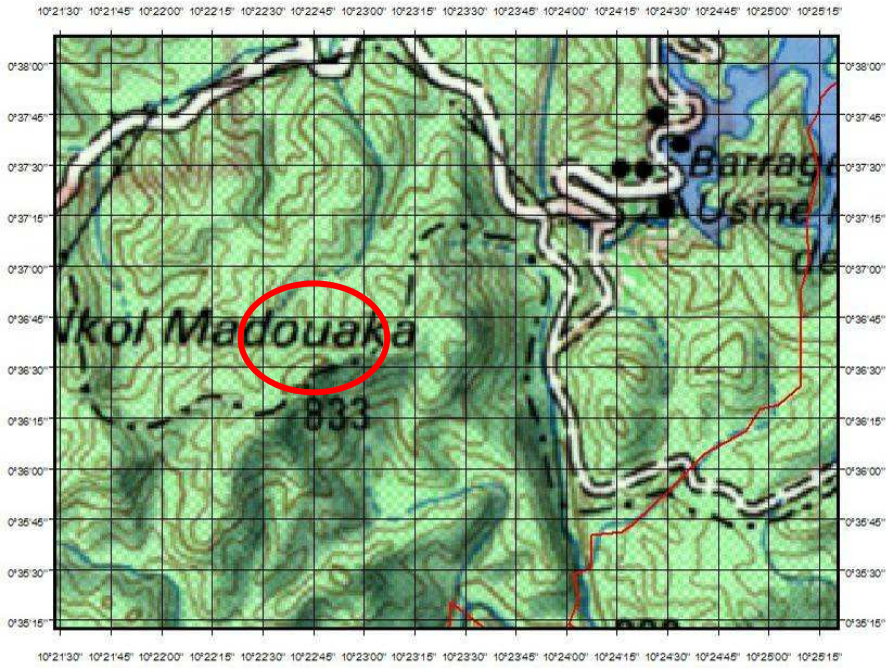
In Monts de Cristal forest was able to persist because typically for then climate low clouds floated in from the ocean which were blow against hills creating misty conditions. So, although regional climate was dry these misty conditions compensated for the drought stress. Even today when the entire country experiences a dry season of at least two months these hills receive rain by the same mechanism.

Because of these circumstances the forest of the Monts de Cristal is climatically stable. In other words this forest will persist despite ongoing global warming. Deforestation of the Monts de Cristal would be reinforced global warming. Therefore, it protection should have the highest priority.





Elevation map of the Monts de Cristal and the profile from the edge to the interior



View of Nkol Madouaka on the national map (see left circled in red)

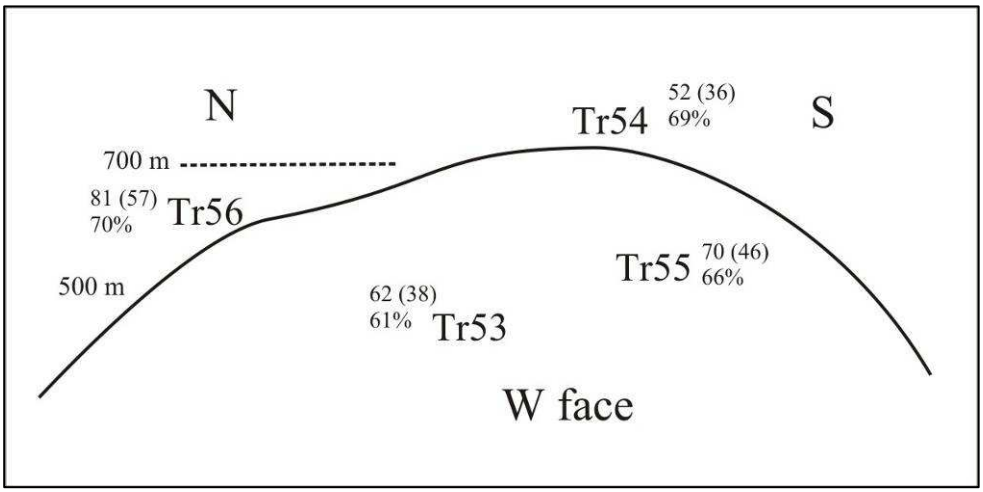
Nkol Madouaka

Nkol Madouaka is situated at the interior of the Monts de Cristal at the zone where the topography gradually becomes less rugged and more gentle like further on the Woleu-Ntem Plateau. Nkol Madouaka is the highest summit in the area with an altitude of 833m. North of the summit the topography is relatively gentle, with valley bottoms descending to only 600m, compared to the south where off the main ridge the southern slopes quickly descends to 500m.

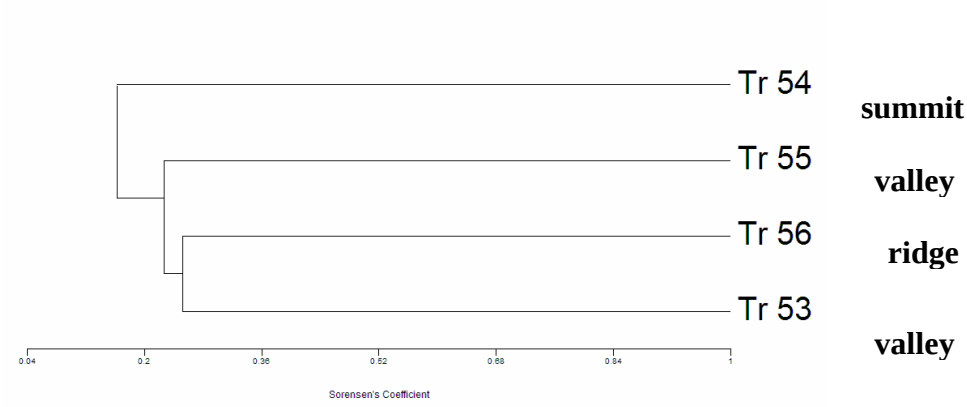
Topography is one of the principle factors determining species composition of the forest in rugged terrain and the effect of altitude and aspect on species composition was shown for the Mt Mbilan site (see biodiversity report on Mt Mbilan). Within this setting the north-west side of the Nkol Madouaka was assessed first, because it was assumed to be the wettest side. The assumption was that biodiversity should for those reasons be highest on this side of the summit.

Experience suggests that biodiversity is lowest on the more exposed places like the main ridge and highest summit, because exposed places experience more environmental extremes, drought stress and disturbance from tree falls. Valleys have a more sheltered environment which would allow a higher diversity of understorey plants with shallow root systems.

As the slope and difference in altitude between summit and valley are less pronounced then at the edge of the Monts de Cristal, species turnover (the number of species only present on a single transects) is expected to be lower.



Profile of the Nkol Madouaka showing the distribution of the transects (T) from bottom to summit and aspect, the figures at each transect are the total number of species, between brackets the number of species restricted to that transect (endemic) and the percentage.



Cladogram showing the relationship (similarity) between the different transects, close e.g. Tr 53 and Tr 56 or distant e.g. Tr 53 and Tr 54.

Methods

The transects used to record species composition were 200 m long and 5 m wide. Every individual with a diameter at breast height (dbh) of 5 cm and greater was recorded and identified or vouchered for identification in the herbarium of Libreville. Often voucher specimens were without flowers or fruits in which case species were identified only on sterile e.g. leaf characteristics. Such identifications are less confident and revered to as morpho-species. Similarity between the transects was calculated by using the Sørensen index. Sørensen index is $S_{12}/[0.5(S_1+S_2)]$ where S_{12} is the number of shared species between two transects and S_1 is the total number of species in transect 1 and similarly S_2.

Nkol Madouaka	Tr 53	Tr 54	Tr 55	Tr 56	average
spp	62	52	70	81	66
n	100	131	121	130	120.5
alpha	69.6	31.8	69.3	91.9	65.7
endemism	38	36	46	57	44.3
%	61	69	66	70	66.7

Mt Mbilan	Tr 2	Tr 3	Tr 6	Tr 5	
	500m	700m	500m	700m	average
spp	68	48	63	63	60
n	141	133	138	149	137.3
alpha	51.6	27.0	44.8	41.2	41.1
%	51	60	56	68	56

Biodiversity characteristics for Nkol Madouaka and Mt Mbilan for transects of similar altitude.

Results

General characteristics

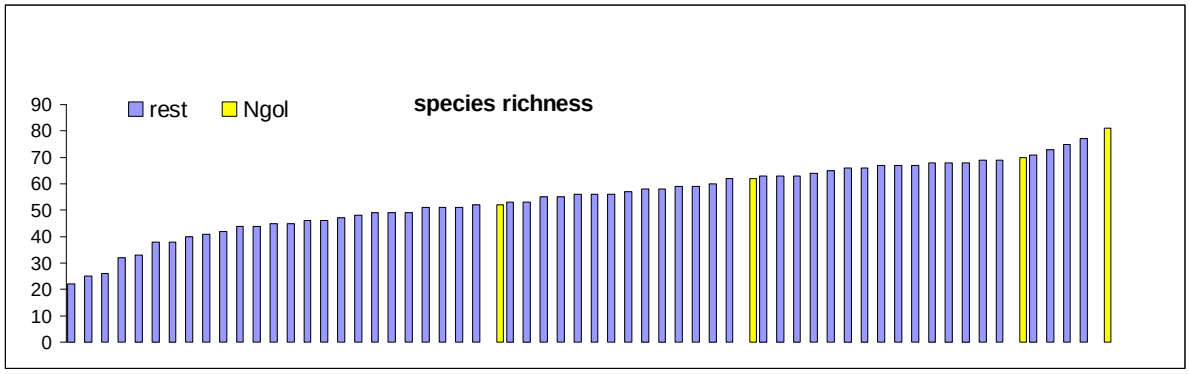
The total recorded species was 211 species. On average 66 species were present on a transect. The highest score was 81 species on Tr56 on the ridge and the lowest 52 species on Tr54 at the summit. Species restricted to a single transect (endemic) varied between 36 (61 %) and 57 (70 %). The number of trees on a transect was in general higher on the ridge and summit than in the valley 130 and 110 on average, respectively. Alpha-diversity varied a lot between summit and ridge, 31.8 and 91.9, respectively and the two valley transects varied little 69.6 and 69.3, respectively.

Similarity

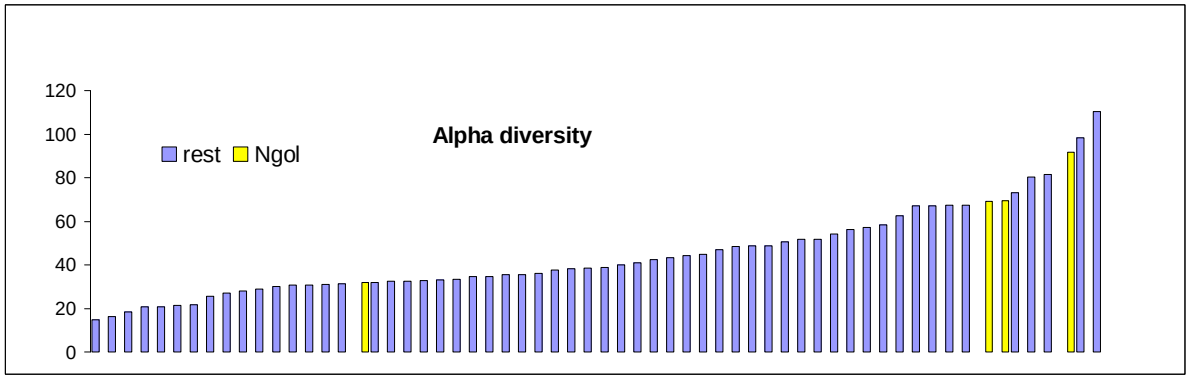
The cladogram (see above) shows a gradient in species composition with the summit transect (Tr 54) at one end and one valley transect (Tr53) at the other end. The summit transect is most dissimilar from the other transects. The valley transects are not grouped and neither the exposed transects on the summit and ridge. The summit transect (Tr54) is most similar the closest valley transect (Tr55) and similarly for the ridge Tr56 and its closed valley transect Tr53).

Endemism/species turnover

Species turnover i.e. the percentage of transect endemics, varied between 61 and 70% (see table above). The highest level of endemism was at the main ridge transect (Tr56) and lowest at the summit (Tr54). Endemism on the valley transects was almost the same, 38 (Tr53) and 36 (Tr55). Species turnover at Nkol Madouaka is high compared to Mt Mbilan at similar altitudes (see table above).



Graph showing species richness in Nkol Madouaka (yellow bars) and other sites in Gabon (blue bars).



Graph showing Alpha diversity in Nkol Madouaka (yellow bars) and other sites in Gabon (blue bars).

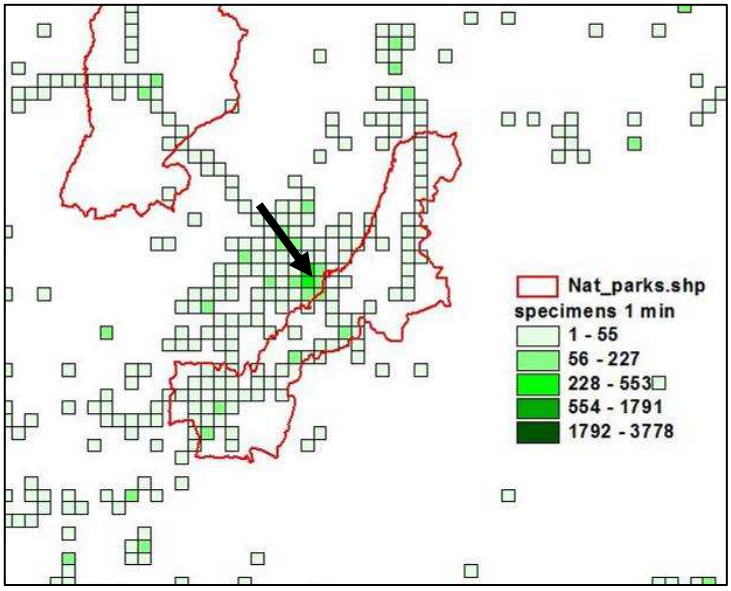
Discussion

The cladogram shows that species composition is most similar between the transects Tr53 (valley) and Tr56 (ridge), which are closest to each other, followed by the valley transect Tr55 and then the transect on the summit (Tr54). Based on environmental differences it was expected that the valley transects would group followed by the ridge transect first and then the summit transect.

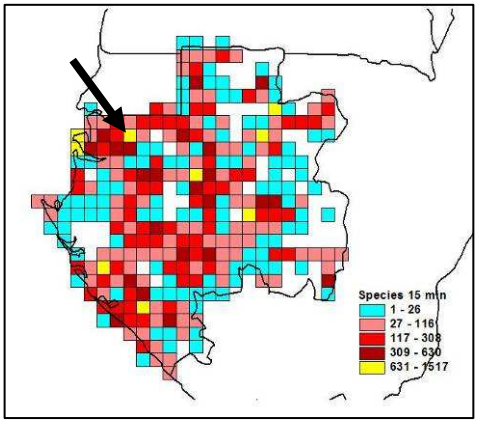
This shows that the similarity in species composition between first two transects (Tr53 and Tr56) is the best explained by distance The second valley transect (Tr55) is situated closest to the transect on the summit, but it still groups more closely to the other transects. This is because summits in general have a different environment from valleys. The summit and the ridge transects were expected to group more closely, because of their similarity of exposedness.

The exceptionality of the summit is also illustrated comparing alpha-diversity values (see the graph above). The summit transect is way off from the other transects, which are at the high end of the graph. A similar pattern has been observed for Mt Mbilan (see table above).

The Nkol Madouaka site has higher biodiversity values (species richness and alpha-diversity) than Mt Mbilan site at similar altitudes (see the tables above). At Mt Mbilan the highest biodiversity values are measured at the lower altitudes (100-300m). Also species turnover was higher at Nkol Madouaka than at the Mt Mbilan. They were expected to be lower as the topography is less pronounced, which is one of the main factors determining species turnover.



Collection densities calculated for 1 min degrees grid cells.



Species densities calculated for 15 min degrees grid cells

General collecting and orchids

Tchimbelé is one of the best collected sites in Gabon (see above). The easy accessibility of Tchimbelé power dam from Libreville (3 hours drive) and the comfortable facilities of Tchimbelé has favored botanical collecting. Most of the collecting has been road side collecting and day trip walks in the forest around the dam. The highest peak in the vicinity is Nkol Madouaka and despite the 20 years of botanical collecting has never been visited until this mission.

unknown Commelinaceae

In total some 112 specimens were collected and their full identification is in process, but there are already some interesting finds for the orchids.

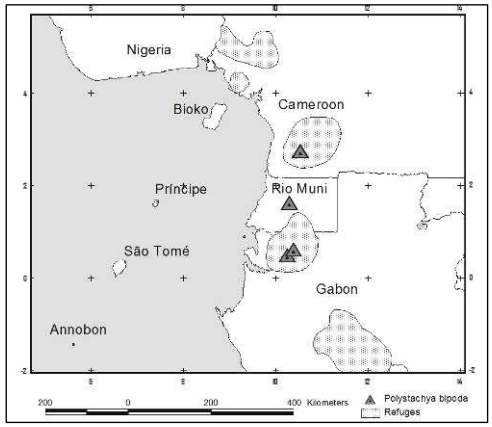
Unknown species

Aerangis nov. sp.?

Orchid diversity

A total of 33 orchid taxa were collected during our survey of the Nkol Maduaka Mountain, in which 10 were new for the Tchimbélé area. The number of orchid taxa in the Tchimbélé area is now equal to 96. It represents 76% of the orchid known from the Monts de Cristal.

We also collected new specimens of two rare orchids which are endemic to the West Central Africa: *Polystachya bipoda* Stévart, limited to the submontane forest that occurs above 600-700 m in North Gabon, Rio Muni and South Cameroun (map 1). This species was only known from three localities.

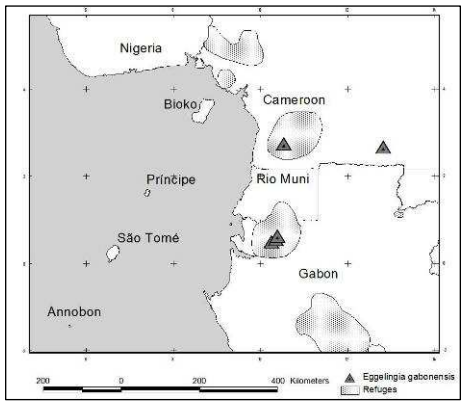


Map1: distribution of *Polystachya bipoda* **Stévart (7 specimens, 4 localities)**

In Gabon, the only specimen was collected in Mont Mbilan, which is presently under threat.

The other species is *Eggelingia gabonensis* P.J.Cribb & Laan which was previously known by four specimens. This tinny orchid is restricted from south Cameroon to North Gabon (map 2). The two specimens collected in Nkol Maduaka were growing in the upper part of the Canopy in a small valley.

Distribution of both species fit well the forest refuge which extends in South Cameroon, Rio Muni and North Gabon. This area should be considered as a single conservation unit.



Map2: distribution map of *Eggelingia gabonensis* **P.J.Cribb & Laan (6 specimens, 5 localities)**

Conclusions

This study was carried out to find out how biodiversity continued further away from the edge of the Monts de Cristal. The difference in rainfall and geology between the edge and interior does not clearly causes distinct changes in biodiversity. Only the lower maximum daily temperatures may give the flora and in particularly orchids a stronger submontane character. The Nkol Madouaka site has a higher biodiversity and a higher species turnover at higher altitude compared to similar altitudes at the edge of Mt Mbilan, which make it one of the sites with the highest plant diversity of Gabon and Central Africa.

Acknowledgements

This project was funded by USAID's Central African Regional Program for the Environment in collaboration Conservation International and the Wildlife Conservation Society. The project thanks for the permission of CENAREST/ the Herbier National du Gabon to work in the area and access there facilities.
Photo's were taken by Miguel Leal and Tariq Stevart.

APPENDIX 1: ORCHID CHECKLIST OF THE TCHIMBÉLÉ AREA

(Based on an initial number of 210 records, 86 'taxa', LGE: Lower Guinean Endemics)

	SPECIES	LGE	Total	Ngol
1	Aerangis nov. sp.?			1
2	Ancistrorhynchus capitatus (Lindl.) Summerh.		9	1
3	Ancistrorhynchus crystalensis P.J.Cribb & Laan	1	6	
4	Ancistrorhynchus tenuicaulis Summerh.		3	
5	Angraecum affine Schltr.		3	
6	Angraecum bancoense W.J.van der Burg		8	1
7	Angraecum distichum Lindl.		1	
8	Angraecum eichleranum Kraenzl. var. curvimentatum Szlach. & Olsz.	1	1	
9	Angraecum gabonense Summerh.		1	
10	Angraecum sp. nov. 2	1	2	
11	Bolusiella talbotii (Rendle) Summerh.		4	1
12	Bulbophyllum acutibracteatum De Wild. var. acutibracteatum		1	
13	Bulbophyllum acutibracteatum De Wild. var. rubrobrunneopapillosum (De Wild.) J.J.Verm.		1	1
14	Bulbophyllum calyptratum Kraenzl. var. calyptratum		1	
15	Bulbophyllum calyptratum Kraenzl. var. graminifolium (Summerh.) J.J.Verm.		1	
16	Bulbophyllum capituliflorum Rolfe		2	
17	Bulbophyllum cochleatum Lindl. var. bequaertii (De Wild.) J.J.Verm.		1	1
18	Bulbophyllum cochleatum Lindl. var. cochleatum		2	
19	Bulbophyllum comatum Lindl. var. comatum	1	1	1
20	Bulbophyllum coriscense Rchb.f.	1	1	
21	Bulbophyllum falcatum (Lindl.) Rchb.f. var. falcatum		1	
22	Bulbophyllum falcatum (Lindl.) Rchb.f. var. velutinum (Lindl.) J.J.Verm.		5	1
23	Bulbophyllum intertextum Lindl.		9	1
24	Bulbophyllum cf maximum			1
25	Bulbophyllum minutifolium Stévart	1	1	
26	Bulbophyllum oreonastes Rchb.f.		3	
27	Bulbophyllum pumilum (Sw.) Lindl.		4	
28	Bulbophyllum resupinatum Ridl. var. filiforme (Kraenzl.) J.J.Verm.		3	1
29	Bulbophyllum resupinatum Ridl. var. resupinatum		1	
30	Bulbophyllum saltatorium Lindl. var. albociliatum (Finet) J.J.Verm.		3	1
31	Bulbophyllum saltatorium Lindl. var. calamarium (Lindl.) J.J.Verm.		1	
32	Bulbophyllum sandersonii (Hook.f.) Rchb.f. var. sandersonii		1	
33	Bulbophyllum scaberulum (Rolfe) Bolus var. scaberulum		1	
34	Bulbophyllum schimperianum Kraenzl.		1	
35	Bulbophyllum schinzianum Kraenzl. var. schinzianum		1	1
36	Bulbophyllum subligaculiferum J.J.Verm.	1	1	
37	Calyptrochilum christyanum (Rchb.f.) Summerh.		2	
38	Calyptrochilum emarginatum (Sw.) Schltr.		2	
39	Chamaeangis ichneumonea (Lindl.) Schltr.		2	
40	Cyrtorchis aschersonii (Kraenzl.) Schltr.		4	1
41	Cyrtorchis chailluana (Hook.f.) Schltr.		2	1
42	Cyrtorchis henriquesiana (Ridl.) Schltr.	1	1	
43	Cyrtorchis ringens (Rchb.f.) Summerh.		1	
44	Cyrtorchis seretii (De Wild.) Schltr.		1	
45	Diaphananthe aff. laticalcar sp. nov. 2	1	1	
46	Diaphananthe sp. nov. 1	1	1	
47	Diceratostele gabonensis Summerh.		1	
48	Dinklageella liberica Mansf.		1	
49	Eggelingia clavata Summerh.		1	
50	Eggelingia gabonensis P.J.Cribb & Laan	1	1	1
51	Eulophia horsfallii (Batem.) Summerh.		3	

52	Eulophia magnicristata Szlach. & Olsz.		1	
53	Graphorkis lurida (Sw.) Kuntze		2	
54	Habenaria buntingii Rendle		1	
55	Habenaria gabonensis Rchb.f.		1	
56	Habenaria procera (Sw.) Lindl.		7	
57	Liparis caillei Finet		1	
58	Liparis cf. goodyeroides			1
59	Liparis epiphytica Schltr.		1	
60	Liparis gracilenta Dandy	1	1	1
61	Liparis mulindana Schltr.		1	
62	Listrostachys pertusa (Lindl.) Rchb.f.		4	1
63	Manniella gustavi Rchb.f.			1
64	Phaius mannii Rchb.f.		1	1
65	Plectrelminthus caudatus (Lindl.) Summerh. var. caudatus		3	
66	Polystachya aff. kubale sp. nov. ?		3	
67	Polystachya albescens Ridl. subsp. albescens		3	
68	Polystachya batkoi Szlach. & Olsz.		1	
69	Polystachya bipoda Stévart			1
70	Polystachya bifida Lindl.			1
71	Polystachya calluniflora Kraenzl.		1	1
72	Polystachya calyptrata Kraenzl.		1	
73	Polystachya cf. adansoniae			1
74	Polystachya fractiflexa Summerh.		1	
75	Polystachya fulvilabia Schltr.		2	
76	Polystachya galeata (Sw.) Rchb.f.		1	
77	Polystachya laxiflora Lindl.		1	
78	Polystachya moniquetiana Stévart & Geerinck	1	1	
79	Polystachya odorata Lindl. var. odorata		7	
80	Polystachya polychaete Kraenzl.		2	
81	Polystachya pyramidalis Lindl.	1	7	
82	Polystachya ramulosa Lindl.		3	
83	Polystachya rhodoptera Rchb.f.		9	1
84	Polystachya seticaulis Rendle		2	
85	Polystachya supfiana Schltr.	1	3	1
86	Polystachya tessellata Lindl.		13	1
87	Polystachya victoriae Kraenzl.		4	
88	Rangaeris trilobata Summerh.	1	4	
89	Solenangis cf. scandens			1
90	Solenangis clavata (Rolfe) Schltr.		1	
91	Stolzia elaidum (Lindl.) Summerh.		1	1
92	Tridactyle anthomaniaca (Rchb.f.) Summerh.			1
93	Tridactyle armeniaca (Lindl.) Schltr.		1	1
94	Tridactyle brevicalcarata Summerh.		1	
95	Tridactyle lagosensis (Rolfe) Schltr.			1
96	Tridactyle truncatiloba Summerh.	1	4	1
	Total	17	210	
			86	33

Appendix 2 common species

	Tr 53	Tr 56	Tr 55	Tr 54
Duguetia 53d	1	3		
Oubanguia africana	1	2		
Hymenostegia klaineana	1	1		
Paraphyadanthe flagelliflora Mildbr.	1	1		
Pentaclethra macrophylla Benth.	1	1		
Strombosia grandifolia	1	1		1
Dichostemma glaucescens Pierre	7	8	18	
Heisteria parvifolia Sm.	1	1	3	
Plagiostiles africana	3	1	1	
dacryodes klaineana	2	3	2	
Scaphopetalum blackii Mast	2	1	1	
Greenwayodendron suavelens	1	5	1	
Santiria trimera	4	4	3	4
Garcinia mannii	4	1	4	2
Tetraberlinia bifoliolata (Harms) Hauman	3	3	3	6
Strombosiopsis tetrandra Engl.	1	9	2	4
Dacryodes macrophylla (Oliv.) Laur.	1	5	2	3
Garcinia smeathmannii (Planch. & Triana) Oliv	1	3	1	9
Bikinia le testui		3	2	2
Dialium pachyphylium		4	3	
Coula edulis		2	2	
Enantia chlorantha Oliv.		1	1	
Hymenostegia floribunda			2	3
Campylospermum 54c			1	2
Diospyros hoyleana			1	1
Mareyopsis longifolia (Pax) Pax & K.Hoffm.			1	2
Anisophyllea myriosticta J.J.Floret		3		1
Dn 600		1		2
Guibourtia ehie	3		1	
Diogoa zenkeri	2		2	
Strombosia pustulata	1		2	
Dacryoddes buetneri	1		1	
Anisophyllea polyreura	1			2
Baphia 53d	1			3

Appendix 2 transect restricted species

	Tr 55
Apocinaceae 55a	4
Cleistanthus 55a	4
Anisophylla 55a	3
Warneckia 55c	3
Anisophylla myrosticta	2
Cola 55d	2
Dialium 55d	2
Sysygium 55a	2
Trichoscypha 55a	2
Aphanocalyx microphylus	1
Baphia 55a	1
Berlinia 55a	1
Calpocalyx 55d	1
Cleistanthus 55a2	1
Cola 55d2	1
Dacryodes 55b	1
Dactyladenia 55b	1
Dactyladenia 55d	1
Dialium 55c	1
Dichaetanthera africana	1
Diospyros melocarpa	1
Erismadelphus 55c	1
Euphorbiaceae 55b	1
Gambeya 55d	1
Garcinia 55c	1
Gilbertiodendron 55a	1
Klainedoxa gabonensis	1
Leonardoxa 55a	1
Leonardoxa africana (Baill.) Aubrév	1
Maesobotrya 55c	1
Octochosmus 55c	1
Octocosmus africanus	1

	Tr 55
Ongokea gore (Hua) Pierre	1
Pancovia 55b	1
Plagiosiphon 55b	1
Rapdophyllum 55a	1
Sapindaceae 55d	1
Sindoropsis le testui	1
Sorindeia 55a	1
Staudtia stipitata	1
Strephonema 55d	1
Synsepalium 55b	1
Trichoscypha 55d	1
Warneckia 55a	1
Warneckia 55a2	1
xylopia 55c	1

Appendix 2 transect restricted species

	Tr 53
Mamea africana	8
Aucoumea kaineana	6
Aubrevilla 53c	2
Beilschmiedia 53b	2
Cola 53d	2
Kleistanthus 53c	2
Trichilla 53a	2
Beilchmiedia 53a	1
Beilschmiedia 53d	1
Bikinia 53b	1
Centroplacus glocinus	1
Cleistanthus 53c2	1
Coelocaryon preussii	1
Dacryodes letestui	1
Dactyladenia 53c	1
Dialium 53b	1
Diospyros 53d	1
Drypetes 53b	1
Drypetes gossweleri	1
Eriocoelum 53a	1
Eriocoelum 53c	1
Euphorbiaceae 53d	1
Garcinia conrauana	1
Hymenostegia 53c	1
Maesobotria 53d	1
Masularia Acuminata	1
Napoleona 53d	1
Oncoba 53d	1
Pancovia 53d	1
Plagiosiphon 53d	1
Plagiosiphon 53d2	1
Pseudospondias 53b	1
Scytopetalum klaineanum	1
Syzyguim 53c	1
Trichoscypha 53b	1
Uapaca 53d	1
Zanthoxylum heitzii	1
Zanthoxylum macrophylla	1

	Tr 54
Allophylus 54c	1
Baphia 54a	5
Beilschmiedia 54b	2
Calpocalyx 54d	1
Campylospermum 54a	2
Cleistanthus 54a	4
Dacryodes 54a	1
Dacryodes 54c	1
Dacryodes 54d	1
Dacryodes heterotricha	1
Dactyladenia 54a	1
Dialium 54d	1
Drypetes 54a	1
Duguetia 54a	1
Duguetia 54d	2
Euphorbiaceae spp 6	14
Euphorbiaceae sp 54b	3
Garcinia lucida Vesque	2
Napoleona 54c	4
Newtonia 54a	1
Ochnaceae 54c	1
Pentadesma grandifolia Baker f.	1
Piptostigma 54b	7
Rubiaceae 54a	2
Rubiaceae 54c	1
Rubiaceae 54d	1
Sibangea 54b	3
Strephonema 54d	1
Synsepalium 54c	4
Synsepalum 54a	4
Syzygium 54a	4
Trichilia 54c	2
Trichoscypha 54a	1
Trichoscypha 54b	1
Trichoscypha 54b2	1
Warneckia 54d	1

Appendix 2 transect restricted species (continued)

	Tr 56
Grewia 56b	3
Anisophyllea purpurascens	2
Dacryodes 56b	2
Trichilia 56b	2
Xylopia 56b	2
Anopyxis klaineana (Pierre) Engl.	1
Anthonatha 56a	1
Beilchmiedia 56a	1
Beilchmiedia 56b	1
Berlinia 56a	1
Bikinia 56a	1
Bikinia 56c	1
bikinia pellegrinni	1
Campylospermum 56a	1
Carapa procera	1
Cleistanthus 56b	1
cleistanthus 56c	1
Cleistanthus 56d	1
Cola nitida	1
cyncepalium 56a	1
Cyncepalium 56a2	1
Dacryodes 53b	1
Dacryodes normandii	1
Dactyladenia 56c	1
Desbordesia glaucecens	1
Dialium 56b	1
Diospyros 56d	1
Drypetes 56a	1
Drypetes 56a2	1
Eriocoelum 56b	1
Garcinia 56c	1
Grewia 56c	1
Irvingia grandifolia	1

	Tr 56
Manilkara 56d	1
Microdesmis afrodencandra	1
Odyendea gabonensis (Pierre) Engl.	1
Plagiosiphon 56d	1
Protomegabaria 56c	1
Psychotria 56d	1
Rapdophylium 56a	1
Rhapdophylium 56c	1
Rubiaceae 56b	1
Rubiaceae 56d	1
Sibangea 56a	1
Sibangea 56c	1
Sibangea 56d	1
Strephonema 56b	1
Trichoscypha 55b	1
Trichoscypha 56a	1
Trichoscypha 56a2	1
Trichoscypha 56b	1
Trichoscypha 56d	1
Trichoscypha arborea	1
Warneckia 56c	1
Xylopia 56a	1
Xylopia 56c	1