East African Scholars Journal of Agriculture and Life Sciences
Abbreviated Key Title: East African Scholars J Agri Life Sci
ISSN 2617-4472 (Print) | ISSN 2617-7277 (Online) |
Published By East African Scholars Publisher, Kenya

OPEN ACCESS

Volume-2 | Issue-6 | Jun-2019 |

Research Article

Floristic study of undergrowth plant formations in *Eucalyptus* If planting Mr. Jansen Lwiro and the Sisters of the Resurrection of Miti, Kabare Territory / South Kivu, DRC

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Abstract: Despite theallelopathic effect to the *Eucalyptus*, we noticed a great floristic richness in the under growth of *Eucalyptus* plantations at Lwiro and Miti.148 species have been recorded in the undergrowth of both plantation sand families best represented were: *Poaceae*, *Fabaceae*, *Asteraceae*, *Rubiaceae*, *Malvaceae*, *Acanthaceae*, *Euphorbiaceae*, *Lamiaceae*. After analyzing the flora, it has been shown that when there is no human perturbation in a *Eucalyptus* arboretum, its dynamics cangoupto forest vegetation**.**

Keywords: Floristic, undergrowth, Eucalyptus, Lwiro, Miti, Kabare.

INTRODUCTION

Since colonial times, the D.R. Congo experienced reforestation actions, here we can include erosion control Missions, which had as main activity to reforest sites subject to erosion and create small forests. These activities are intensified in rural areas and the South Kivu province has also not been spared. In South Kivu, these actions were most intense in the Walungu territory, Luhwindja, Kaziba and Kabare. After the population has found the importance of Eucalyptus for several needs; firewood, timber, it's like that, that many plantations have been established in many parts of the above-mentioned territories including that of Lwiro (Mr Janssen Plantation) and that of the Resurrection Sisters Miti.

According to Rao *et al.*, Cited by Habonimana (2007), Eucalyptus are part of agro-forestry species with allelopathic effects; that is to say, that prevent the growth of other species in a given plant community. Something that has already been observed in several places where these species are used in agro forestry, we first see bare soil following the non-decomposable sheets by microorganisms of the earth, but also for lack of a herbaceous plant cover in the sub -wood.

The main purpose of this study is to make a floristic inventory of the undergrowth in Eucalyptus plantations in the territory of Kabare specifically to Lwiro and Miti. This is basically to do a floristic and ecological study of species characterizing the undergrowth in both plantations mentioned above. First floristically, highlight the species characteristic for both phytocenoses. Ecologically, aim for the work has to know the consistency of differential between the two species studied phytocenoses.

Brief Description of Kabare

Kabare is one of the eight territories of the province of South Kivu (eastern DRC) Democratic Republic of Congo. It is limited:

- North of Kalehe territory;
- South by Walungu territory;
- On the East by Lake Kivu;
- West by PNKB

Quick Response Code

Journal homepage:
http://www.easpublisher.com/easjals/

Article History
Received: 25.05.2019
Accepted: 08.06.2019
Published: 27.06.2019

DOI: 10.36349/easjals.2019.v02i06.009

Above-mentioned territories inclunding that of Lwiro (Mr Janssen plantation: 2°14′40, 48″ S; 28°49′33,09″ E, Elevation 1643 m) and that the Resurrection Sisters Miti : 2°20′55,48″ S; 28°47′38,93″ E, Elevation 1603 m. It is at an altitude of 1500 meters and is subject to a humid tropical climate. Rainfall varies there between 1300 mm and 1800 m per year. This area lies between 28 ° east, 29 ° W and 2 ° south latitude. Its landscape is dominated by mountains, the highest peaks are: Kahuzi Biega with 3308 m and 2700 m with. Within this entity, we also find entire hills that are unfavorable structures of human life and are uninhabited. The average temperature of the area is 19.5 ° C. The soil is volcanic Kabare for the greater part of the territory. It is a rich and productive soil but due to overexploitation and exposure to erosion in all its forms (wind and water), it became one of the poorest. NGDOs and customary power were mobilized to protect the soil through sensitization and training of farmers in 2009).

RESEARCH METHODS

To better study the variability of vegetation types in our two phytocenoses, the first operation was to recognize the station. Then the phytosociological Braun-Blanquet method is the one that was Kabare on erosion control, management of nurseries (ICCN-PNKB) used for data collection. Next homogeneity and heterogeneity of vegetation, the coefficient of abundance-dominance was assigned to each species in order to know well his role in the vegetation studied. Mixed scale according Braun-Blanque*t al.*,lowed the numerical assessment of this factor:
+: Solitary individuals, rare or very few with very low or insignificant recovery.

1: few individuals with a low degree of overlap of 5% of the studied surface.
2: many individuals least covering from 5 to 25% of the studied surface.
3: Number of individuals covering some 25 to 50% of the studied surface.
4: Number of individuals covering some 50 to 75% of the studied surface
5: Number of individuals some covering over 75% of the test surface

This allowed us to know the species that characterize the woods and put highlighted the spontaneous species that are part of the flora of these plantations. On the ground, we were always with a bag for collecting samples that seemed difficult to identify in the field. After drying, the Troupin Flores (1978 and 1985) and the work of Fischer & Killman (2008) have been of great importance for the identification of these samples.

RESULTS AND DISCUSSION

In this study, we surveyed 148 species of plants. These are grouped in floristic list (list); they are presented in alphabetical order of families, genera and species. Thus, the morphological and biological types were assigned to each species.

Best Represented Families

Poaceae and *Fabaceae* families are those with more species each with 9 species (6.1%); they are followed by *Asteraceae*, *Malvaceae* and *Rubiaceae*, each with 8 species (5.4%). Are both represented the *Acanthaceae* family, *Euphorbiaceae* and *Lamiaceae* with respectively 7, 6 and 5. Finally, we see the *Solanaceae* and *Vitaceae* each with 4 species. Other families whose number of species varies between two and three are set as follows:

- Families with 3 species: Anacardiaceae; Asparagaceae, Phyllanthaceae, Rhamnaceae, Moraceae, Rutaceae and Oleaceae.
- Families with 2 species: Amaranthaceae, Bignoniaceae,Apocynaceae,Celastraceae,Commelinaceae,Convolvulaceae,Crassulaceae,Cucurbitaceae,Menispermaceae,Passifloraceae,Myrtaceae, Rosaceae and Sapindaceae. Other families have only one species.

In Butembo (Kataomba *et al.*, 2010) and Mugeri (Iragi *et al.*, 2012), the family *Asteraceae* is among those who have more species in the undergrowth Eucalyptus; first and second in Butembo Mugeri. A Lwiro and Miti said family had more species, third after the *Poaceae* and *Fabaceae*. By cons to Mugeri and explored in both plantations (Lwiro and Miti), *Fabaceae* are the most represented in the undergrowth.

Table.1 Floristic list of Species Inventoried
T.M : type morphologique T.B : type biologique

N°	Families and species	TM	TB
	Acanthaceae		
1	*Acanthus pubescens* (TH) ENG	Arb	Mcph
2	*Asystasia gangetica* (L.)T. ANDERSON	Hvi	Chpr
3	*Barleria ventricosa* HOCHST ex NEES	Hvi	Chpr
4	*Dyschoriste radicans* T. ANDERSON	Ha	TSC
5	*Justicia flava* VAHL	Hvi	Chpr
6	*Hypoestes forskalei* (VAHL) SOL.	Hvi	Chpr
7	*Rungia grandis* T. ANDERSON	Hvi	TSC
	Amaranthaceae		
8	*Achyranthes aspera* L.	Hvi	TSC

9	*Cyathula uncinulata* SCHINZ.	Hvi	TSC
	Anacardiaceae		
10	*Mangifera indica* L.	Arb	Mcph
11	*Pseudospondias microcarpa* L.	Arb	Mcph
12	*Rhus vulgaris* MEIKLE	Arb	Mcph
	Annonaceae		
13	*Annona reticulata* L.	Arb	Mcph
	Apiaceae		
14	*Hygrocaris incognita* HEY et JURY	Hvi	Chpr
	Apocynaceae		
15	*Rhynchostigma racemosa* BENTH	L	Phgr
16	*Nerium oleander* L.	Arb	Mcph
	Araceae		
17	*Xanthosoma sagitifolia* L.	Hvi	Gtu
	Araliaceae		
18	*Polyscias fulva* (HIERN.) HARMS	Arb	Mcph
	Asparagaceae		
19	*Agave americana* L.	Hvi	Naph
20	*Agave sisalana* WILLD	Hvi	Naph
21	*Dracaena fragans* (L.) KG	S-arb	Naph
	Aspleniaceae		
22	*Asplenium megalura*	Hvi	Grh
	Asteraceae		
23	*Ageratum conyzoides* L.	Ha	TSC
24	*Crassocephalum montuosum* SCHELL	Ha	Chpr
25	*Gynura scandens* O.HOFFM	Ha	Naph Naph
26	*Melanthera scandens* (T.) ROBERTY	S-arb	Phgr
27	*Microglossa pyrifolia* (LAM) 0.KUNTZE	L	Cher
28	*Tithonia diversifolia* (HEM) A. GRAY	S-arb	Mcph
29	*Vernonia amygdalina* DELILE	Arb	Naph
30	*Vernonia lasiopus* O.HOFFM	S-arb	
	Balsaminaceae		
31	*Impatiens balsamina* L.	Ha	TSC
	Bignoniaceae		
32	*Markhamia lutea* (BENTH) K. SCHUM	Arb	Mcph
33	*Spathodea campanulata* P. BEAUV	Arb	Mcph
	Boraginaceae		
34	*Cordia africana* LAM	Arb	Mcph
	Cannaceae		
35	*Canna indica* L.	Hvi	Grh
	Ccaryophyllaceae		
36	*Drymaria cordifolia* (L.)WILLD ex ROCHN	Hvi	Chpr
	Celastraceae		
37	*Maytenus arguta* (LOES) N. ROBSON	Hvi	Chpr
38	*Salacia erecta* L.	Arb	Mcph
	Commelinaceae		
38	*Commelina benghalensis* C.B. CLARKE	Hvi	Chpr
40	*Commelina diffusa* BOURM. F.	Hvi	Chpr
	Convolvulaceae		
41	*Hewittia sablobata* L.	L	Phgr
42	*Ipomoea* sp.	Hvi	Chgr
	Cornaceae		
43	*Alangium chinens* (L.F) REDDER	Arb	Mcph
	Crassulaceae		
44	*Kalanchoe Integra* MED.O.KUNTZE	Hvi	Chpr
45	*Kalanchoe pinata* DEWILLD	Hvi	Chpr
	Cucurbitaceae		
46	*Momordica foetida* SCHUMACH	Hvi	Chgr

47	*Mukia maderaspatana* (L.) M.ROEM	Ha	Tgr
	Cuppressacea		
48	*Cupressus lusitanica* MILL.	Arb	Mcph
	Cyperaceae		
49	*Cyperus laticifolius* POIRET	Hvi	Grh
	Dioscoreaceae		
50	*Dioscorea alata* L.	Hvi	Gtu
	Dryopteridaceae		
51	*Dryopteris* sp.	Hvi	Grh
	Euphorbiaceae		
52	*Erytrococca bongeensis* PAX	S-arb	Naph
53	*Erytrococca japonica* PAX	S-arb	Naph
54	*Manihot esculenta* CRANTZ	S-arb	Naph
55	*Sapium ellipticum* (KRAUSS) PAX	Arb	Mcph
56	*Securinega virosa* (R. ex. W.) BAILL.	S-arb	Naph
57	*Tragia brevipes* PAX	Hvi	Cher
	Fabaceae		
58	*Albizia gummifera* (J.F.GMEL) C.A.SM	Arb	Mcph
59	*Cassia floribunda* L.	Arb	Mcph
60	*Cassia mimosoides* L.	Hvi	Chpr
61	*Desmodium repandum* (VAHL) D.C.	Hvi	Chpr
62	*Desmodium trifolium* (L.) D.C.	Hvi	Chpr
63	*Erythrina abyssinica* LAM ex A.RICH	Arb	Mcph
64	*Glycine wigthii* VERDEC	Hvi	Chgr
65	*Rhynchosia* sp.	Arb	Naph
66	*Vigna vexillata* (L.) BENTH	L	Chgr
	Gentianaceae		
67	*Anthocleista grandiflora* GILG	Arb	Mcph
	Hypericaceae		
68	*Harungana madagascariensis* LAMex P.	Arb	Mcph
	Hypolepidaceae		
69	*Pteridium aquilinum* (L.)KAH	Hvi	Cher
	Lamiaceae		
70	*Clerodendron rotundifolium* OLIV	S-arb	Naph
71	*Hoslundia oppositae* VAHL	S-arb	Naph
72	*Leucas deflexa* HOOK.f.	Ha	Chpr
73	*Ocimum gratissimum* L.	Ha	TSC
74	*Solenostemon salvaticum* (G.) RICH	Hvi	TCes
	Lauraceae		
75	*Persea americana* MILL.	Arb	Mcph
	Leeaceae		
76	*Leea guineensis* G.DON	Arb	Mcph
	Maesaceae		
77	*Maesa lanceolata* FORSSKAL	Arb	Mcph
	Malvaceae		
78	*Hibiscus noldae* L.	S-arb	Naph
79	*Hibiscus* sp.	Ha	Chpr
80	*Kosteletskya odoensis*(H.ex.A.R) M.	S-arb	Naph
81	*Pavonia wiotii* CAY	S-arb	Naph
82	*Triumfetta cordifolia* A. RICH	S-arb	Naph
83	*Triumfetta rhomboidea* JACQ.	S-arb	Cher
84	*Sida acuta* BURM	S-arb	Cher
85	*Urena lobata* L.	S-arb	Chpr
	Melastomataceae		
86	*Dissotis brazzae* LOGN	Hvi	Chpr
	Menispermaceae		
87	*Cissampelos micronata* A.RICH	Hvi	Chgr
88	*Stephania abyssinica* (W. et R.) WALP	Arb	Mcph
	Moraceae		

89	*Ficus vallis- choudae* DILL	Arb	Mcph
90	*Ficus* sp.	Arb	Mcph
91	*Morus indica* L.	S-arb	Chpr
	Myrtaceae		
92	*Eucalyptus globulus* LABILL	Arb	Mcph
93	*Psidium guajava* L.	Arb	Mcph
	Nephrolepidaceae		
94	*Nephrolepis biserrata* (SW.) R.SCHOTT	Hvi	Grh
	Oleaceae		
95	*Jasminium abyssinicum* HOCHST ex D.C	L	Phgr
96	*Jasminium* sp.1	L	Phgr
97	*Jasminium* sp.2	L	Phgr
	Onagraceae		
98	*Lwidigia abyssinica* A.RICH	S-arb	Cher
	Orchidaceae		
99	*Disa* sp.	Hvi	Chpr
	Passifloraceae		
100	*Adenia bequaertii* ROBYNS	L	Phgr
101	*Passiflora edulis* SIMS	L	Phgr
	Phyllanthaceae		
102	*Bridelia micranta* PAX	Arb	Mcph
103	*Phyllantus capillaris* SCHUM	Ha	TSC
104	*Phyllantus niruri* L.	Ha	TSC
	Poaceae		
105	*Bambusa vulgaris* S. ex. W.	Arb	Mcph
106	*Imperatta cylindrica* (L.) RAEUSCHEL	Hvi	Grh
107	*Hypparhenia diplandra* (HACK) STAPF	Hvi	HCes
108	*Leersia hexandra* SW.	Hvi	TSC
109	*Panicum brevifolium* L.	Hvi	HCes
110	*Paspalum congegatum* LAM	Hvi	HCes
111	*Pennisetum purpureum* SCHUM	Hvi	Grh
112	*Pennisetum trachyphyllum* PULG.	Hvi	Grh
113	*Oplismenus hirtellus* (L.) BEAUV	Hvi	Tgr
114	*Zea mays*	Ha	TSC
	Polygonaceae		
115	*Polygonum* sp.	Hvi	TSC
	Polypodiaceae		
116	*Drynaria laurentii* (CHRIST) HIERON	Hvi	Tgr
	Proteaceae		
117	*Grevillea robusta* A.CUNN	Arb	Mcph
	Pteridaceae		
118	*Pteris pteridioides*	Hvi	Grh
	Rhamnaceae		
119	*Gouania longispicata* ENGL	L	Phgr
120	*Rhamnus prinoides* L'HERIT	Arb	Naph
121	*Rhamnus* sp	Arb	Naph
	Rosaceae		
122	*Rubus apetalus* POIR	L	Phgr
123	*Rubus steudnerii* SCHUM	L	Phgr
	Rubiaceae		
124	*Canthium hispidum* DEWILLD	Arb	Mcph
125	*Chassalia subochreata* (D.) ROBYNS	Arb	Naph
	Cinchona ledgeriana MOENS & TRIME	Arb	Mcph
126	*Coffea arabica* L.	S-arb	Naph
127	*Pavetta rwandeensis* (L.F) HIERN	Arb	Mcph
128	*Keetia rwandeensis* BRIDSON	Arb	Mcph
129	*Rubia cordifolia* (GANGOGER) VERDC	L	Chpr
130	*Spermacoce lactifolia* AULL	Ha	Cher

131		Ha	Chrpr
	Rutaceae		
132	*Citrus limonii* (L.) BURM. F.	Arb	Mcph
133	*Clausena anisuta* L.	Arb	Mcph
134	*Toddalia asiatica* (L.) LAM	S- Arb	Naph
	Sapindacea		
135	*Allophyllus kivuensis* GILG	Arb	Mcph
136	*Paulina pinata* L.	L	Phgr
	Salicaceae		
137	*Diovalys* sp.	Arb	Mcph
	Solanaceace		
138	*Solanum americanum* MILLER	Hvi	TSC
139	*Solanum angustipinosum* DEWILLD	Arb	Naph
140	*Solanum mauritianum* SCOP	Arb	Naph
141	*Solanum terminale* FORSSKAL	Hvi	Chgr
	Thelypteridaceae		
142	*Pneumatopteris afra* (K.) HOLLTUM	Hvi	Chgr
	Verbenaceae		
143	*Lantana camara* L.	Arb	Naph
	Vitaceae		
144	*Cissus adenocaulis* (STEUDEL) DIX	L	Phgr
145	*Cissus quadrifolia* WILLD	L	Phgr
146	*Rhoicissus tridentata* (L.F) DRUMOND	L	Phgr
147	*Vitaceae* sp	L	Phgr
	Zingiberaceae		
148	*Aframomum laurentii* (D.) SCH.	Hvi	Grh

a) Morphological Types of species inventoried

Table2. Morphological Types

Morphological types	Species number	Percentage %
Woody plants	**84**	**56,76**
• Shrubs (shr)	46	31,08
• Sub –Shrubs (S-shr)	21	14,20
• Creepers (Cr)	17	11,49
Herbaceous plants	**64**	**43,24**
• Annual herb (Ah)	13	8,78
• Perennial herb(Ph)	51	34,46
Total	**148**	**100,00**

The interpretation of Table 1 shows that woody plants dominate with 84 species (56.76%), including 46 tree species (31.08%), 21 sub-shrub species (14.20%) followed by lianas have 17 species (10.56%). Herbaceous plants are 64 species (43.24%), 51 perennial species (34.01%) and 13 annual species (8.84%).

Already here, we find that the undergrowth of Eucalyptus plantations is rich in species, 148 species have been recorded in Lwiro and Miti. In Butembo, Kataomba *et al.*, 2010 had inventoried 72 species they described as weeds in Eucalyptus plantations. Contrary to what we observed, species that dominate plantations Butembo are herbaceous (85%) whereas Lwiro and Miti, it is the timber that dominate 57%. This is said to be the age of the plantations, but also the type of service they have vis-à-vis their operators.

b) Biological Types

Table 3 Biological types

Biological types	Number of species	Percentage
Phanerophytes	82	55, 41
Chamephytes	34	22, 97
Therophytes	17	11, 48
Geophytes	12	08, 11
Hemicryptophytes	03	2, 03
Total	**148**	**100.00**

Table 4: Survey of Phytosociological undergrowth in planting Eucalyptus of Lwiro

Number of Statement	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Area of Statement (m²)	110	80	42	54	80	90	100	42	88	70	75	80	65	70	85	90	87	95	80	65
Total exaction of under-woods (%)	80	60	50	70	80	80	70	80	80	40	50	60	75	50	65	70	45	55	70	50
Number of species	25	2	1	2	1	1	12	1	1	2	1	2	2	2	1	1	1	2	1	1
		2	5	0	6	8		5	7	4	5	0	3	5	2	7	3	0	4	6
Total exaction of *Eucalyptus*	50	20	10	40	60	10	20	40	40	60	20	10	30	40	50	20	10	10	40	50
Number of legs to *Eucalyptus*	12	8	3	8	7	4	5	7	6	8	7	8	7	4	3	5	6	8	9	7
Achyranthes aspera	+.1					+.1			+.1		+.1					+.1				+.1
Adenia bequaertii	+.2		+.1	+.1					+.2				+.1							
Albizia gummifera							+.1	+.1			+.1									
Asystasia gangetica	+.1	+.1				+.1														
Alangium chinense			+.1			+.1					+.1									
Aframomum laurentii	+.2																			
Allophyllus kivuensis						+.1					+.1									
Asplenium megalura	+.1					+.1				+.1										
Bridelia micrantha	+.2	+.1	+.1	+.1	+.1	+.1		+.1		+.1										
Cassia floribunda				+.1							+.1									
Cassia mimosoïdes	+.1		+.1			+.1														
Chassalia subocrheata									+.1		+.1									
Cinchona ledgeriana	+.1			+.1				+.1		+.1										
Cissampelos mucronata	+.1			+.1	+.1															
Cissus adenocaulis		+.1			+.1						+.1									
Cissus quadrifolia	+.1										+.1									
Clausena pinnata		+.1																		
Cyperus latifolius			+.1				+.2													
Desmodium repandum		+.1																		
Desmodium trifolium	+.1																			
Disa sp.	+.1			+.1			+.1	+.1												

Drymaria cordifolia		+.1	+.1						+.1											
Erythrina abyssinica					+.1						+.1									
Erythrococca bongoensis	+.1					+.1		+.1												
Eucalyptus globulus	3.2	1.1	1.1	1.1	1.2	2.2	1.2	1.2	2.2	2.3	2.2	3.3	1.1	1.1	1.2	2.3	3.2	1.1	1.2	2.3
Ficus sp.				+.1								+.1								
Jasminium abyssinica	+.2		+.1	+.1		+.1					+.1									
Jasminium sp1	+.2				1.3	+.1			+.1			+.1								
Jasminium sp2		+.1		+.1				+.2			+.1									
Justicia flava	+.1									+.1										
Harungana madagascariensis	+.1									+.1										
Hoslundia opposita									+.1											
Gouania longispiculata										+.1										
Keetia rwandensis		+.1								+.1										
Kostleskya adoenis		+.2																		
Lantana camara	+.2	+.1		+.1	2.2					+.3										
Maesa lanceolata		+.1	+.1	+.1	+.1	+.1	+.1	+.1		+.1										
Markhamia lutea		+.1																		
Maytenus arguta										+.1										
Microglossa pyrifolia		+.1																		
Nephrolepis bisserata				+.1						+.1										
Ocimumgratissimum								+.1												
Oplismenus hirtellus								+.2												
Panicum brevifolium	+.3	+.3	+.1																	
Passiflora edulis							+.2		+.1											
Paulina pinnata				+.1				+.1	+.1											
Pavetta rwandensis		+.1					+.1	+.1	+.1											
Pennisetum purpureum							3.5			+.3										
Pennisetum trachyphyllum	+.3																			
Phyllanthus capillaris			+.1	+.1																

Phyllanthus niruri										+.1										
Psidium guajava				+.1		+.1														
Pseudospondias microcarpa						+.1				+.1										
Rhamnus prinioides					+.1					+.1										
Rhus vulgaris					+.1															
Rubia cordifolia										+.1										
Rubus apetalus				+.1		+.1	+.1	+.1												
Rubus steudnerii	+.1									+.1										
Rungia grandis	3.4	2.4	2.4		+.3	+.1	1.3	3.5	3.5	3.5										
Salacia errecta		+.2				+.1			+.2											
Sapium ellipticum			+.2	+.1	+.1					+.1										
Sida acuta									+.1											
Solanum angustipinosum	2.3	1.2	1.2	1.1	+.1	1.1	1.2	1.2	+.2	2.3	+.1									
Solanum sylvaticum			+.1							+.1										
Toddalia asiatica	+.1		+.1	1.3			+.1		+.1	+.1										
Triumfetta cordifolia					+.1				+.1		+.1									
Triumfetta rhomboidea					+.1					+.1										
Urena lobata		+.1			+.1				+.1		+.1									

a) Location and ecological conditions surveys Table 1

- Statement 1: Level surface covered with soil arboretum as operating mode and presence of organic waste or more leaves fall on vegetation cover.
- Statement 2: Level surface covered with several sheets.
- Statement 3: Flat surface with presence of organic waste (leaves) and inorganic (rocks); a path going in the statement.
- Statement 4: Flat surface, the statement is located next to a corn field with the presence of organic and inorganic waste.
- Statement 5: Level surface covered with several sheets.
- Statement 6: Level surface covered with several sheets.
- Statement 7: Level surface covered with several sheets.
- Statement 8: raised to Level surface next to a stream and a cassava field with the presence of organic and inorganic waste.
- Statement 9: Flat surface; amid this statement peasants have left the waste from sugar cane, and after consumption they are burned in the fire; there is also beeswax and several leaves that fall to
- The ground.
- Statement 10: raised to Level surface next to a stream and a cassava field with the presence of organic and inorganic waste.
- Statement 11: Level surface covered with several sheets.
- Statement 12: Level surface covered with several sheets.
- Statement 13: Level surface covered with several sheets.
- Statement 14: Flat surface with organic waste; a path traverses from the record and the other around thereof. Existence of a foot of *Mangifera indica* in the middle of the

statement.
Statement 15: Level surface covered with several sheets.

- Statement 16: Level surface covered with several sheets.
- Statement 17: Level surface covered with several sheets.
- Statement 18: Level surface covered with several sheets.
- Statement 19: Level surface covered with several sheets.
- Statement 20: Level surface covered with several sheets.

Table 5: Survey of Phytosociological undergrowth in planting Eucalyptus Miti

Number of Statement	**S.1**	**S.2**	**S.3**	**S.4**	**S.5**	**S.6**	**S.7**	**S.8**	**S.9**	**S.10**
Area of Statement (m²)	110	80	42	54	80	90	100	42	88	70
Total exaction to under-woods (%)	80	60	50	70	80	80	70	80	80	40
Number of species	25	13	12	13	16	18	12	15	17	24
Total exaction of *Eucalyptus*	50	20	10	40	60	10	20	40	40	60
Number of legs to *Eucalyptus*	12	8	3	8	7	4	5	7	6	8
Achyranthes aspera									+.1	
Adenia bequaertii	+.2		+.1	+.1					+.2	
Albizia gummifera							+.1	+.1		
Asystasia gangetica	+.1	+.1				+.1				
Alangium chinense			+.1							
Aframomum laurentii	+.2									
Allophyllus kivuensis						+.1	+.1			
Asplenium megalura										+.1
Bridelia micrantha	+.2	+.1	+.1	+.1	+.1	+.1	+.1	+.1		+.1
Cassia floribunda				+.1						
Cassia mimosoïdes			+.1							
Chassalia subocrheata									+.1	
Cinchona ledgeriana				+.1				+.1		+.1
Cissampelos mucronata	+.1			+.1	+.1					
Cissus adenocaulis		+.1			+.1					
Cissus quadrifolia	+.1									
Clausena pinnata		+.1								
Cyperus latifolius							+.2			
Desmodium repandum		+.1								
Desmodium trifolium	+.1									
Disa sp.				+.1			+.1	+.1		
Drymaria cordifolia		+.1	+.1						+.1	
Erythrina abyssinica					+.1					
Erythrococca bongoensis						+.1		+.1		
Eucalyptus globulus	3.2	1.1	1.1	1.1	1.2	2.2	1.2	1.2	2.2	2.3
Ficus sp.				+.1						
Jasminium abyssinica	+.2		+.1	+.1		+.1	+.1			
Jasminium sp1	+.2				1.3	+.1			+.1	
Jasminium sp2		+.1		+.1				+.2		
Justicia flava	+.1									
Harungana madagascariensis	+.1									
Hoslundia opposita									+.1	
Gouania longispiculata										+.1
Keetia rwandensis		+.1								
Kostleskya adoenis		+.2								
Lantana camara	+.2	+.1		+.1	2.2					+.3
Maesa lanceolata		+.1	+.1	+.1	+.1	+.1	+.1	+.1		+.1
Markhamia lutea		+.1								
Maytenus arguta										+.1
Microglossa pyrifolia		+.1								
Nephrolepis bisserata				+.1						
Ocimumgratissimum								+.1		

Oplismenus hirtellus								+.2		
Panicum brevifolium	+.3	+.3	+.1							
Passiflora edulis							+.2		+.1	
Paulina pinnata				+.1				+.1	+.1	
Pavetta rwandensis		+.1					+.1	+.1	+.1	
Pennisetum purpureum							3.5			+.3
Pennisetum trachyphyllum	+.3									
Phyllanthus capillaris			+.1	+.1						
Phyllanthus niruri										+.1
Psidium guajava				+.1						
Pseudospondias microcarpa										+.1
Rhamnus prinioides					+.1					+.1
Rhus vulgaris					+.1					
Rubia cordifolia										+.1
Rubus apetalus				+.1			+.1	+.1		
Rubus steudnerii	+.1									+.1
Rungia grandis	3.4	2.4	2.4		+.3	+.1	1.3	3.5	3.5	3.5
Salacia errecta		+.2							+.2	
Sapium ellipticum			+.2	+.1	+.1					
Sida acuta									+.1	
Solanum angustipinosum	2.3	1.2	1.2	1.1	+.1	1.1	1.2	1.2	+.2	2.3
Solanum sylvaticum			+.1							
Toddalia asiatica	+.1		+.1	1.3			+.1		+.1	
Triumfetta cordifolia									+.1	
Triumfetta rhomboidea										+.1
Urena lobata		+.1								

b) Location and ecological conditions surveys of Table 2

- Statement 1: Flat surface; several sheets cover it.
- Statement 2: Flat surface; several sheets cover it.
- Statement 3: Flat surface; several sheets cover it.
- Statement 4: Flat surface; several sheets cover it.
- Statement 5: Flat surface; several sheets and cover the way through it. .
- Statement 6: Flat surface; several sheets and cover the way through it. .
- Statement 7: Flat surface; several sheets cover it.
- Statement 8: Flat surface; several sheets cover it.
- Statement 9: Flat surface; several sheets cover it.
- Statement 10: Flat surface and almost naked with organic waste.

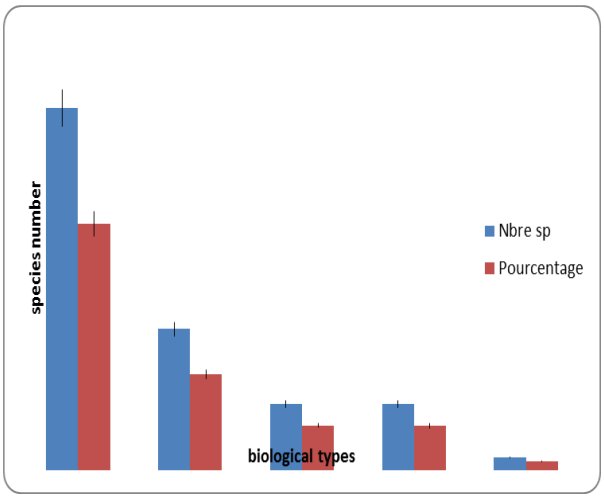

Figure1. Spectrum of biological species inventoried

Figure 1 shows that phanerophytes are more dominant with 82 species (55.41%). Come in the following chamaephytes (22.97%) and after Therophytes (11.48), Geophytes (8.11) and Hemicryptophytes with 2.03%.

Similarity and diversity of plantations prospected

Here the similarity for species characteristics of planting the following species are present or absent in the statements. In both plantations, identified 20 were executed. Next the Squared Euclidean algorithm, the percent similarity between readings is given in Figure 2.

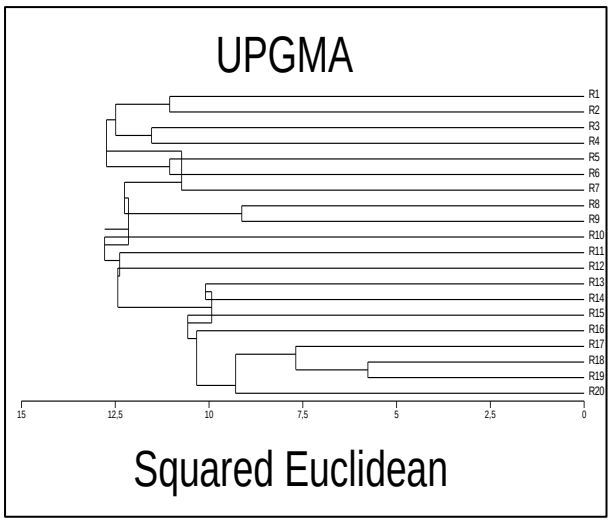

Figure2. Similarity between surveys in Eucalyptus plantations Lwiro and Miti

Resemblance between the Two Plantations

Whether in planting Miti or Lwiro, we found the dominance of the species *Solanum angustipinosum*. In all executed statements, this species has marked its presence and dominance. There were also several other species that are abundant in the woods of Eucalyptus plantations in both countries. For sub-shrubs is *Sercurinega virosa*, *Hoslundia opposita*, *Lantana camara*, *Clerodendron rutundifolium*.

Floristic and dynamic richness of understory vegetation wood Eucalyptus sites studied For this study, we found that the undergrowth in plantations Eucalyptus is rich in species, largely being secondary forest species. For this, we say that with age the allelopathic effect of Eucalyptus decreases. This promotes the development of herbaceous species. These contribute to the production of good humus, which promotes the development of several other tree species. We noted the presence of several forest species in both plantations; to Lwiro and Miti: *Alangium chinense, Maessa lanceolata, Todalia asiatica, Sapuium ellipticum, Bridellia micrantha, Maessa lanceolata, Guania longispicata, Polyscias fulva, Paulina pinata, Pseudospondias microcarpa, Rynchostigma racemosa, Securinega virosa, Asplenium megalura, Cordia africana, Maytenus arguta , Salacia errecta, alata, Erytrococca bongeensis, Microglossa pyrifolia, Albizia gummifera, Desmodium rependum, Leea guinensis, Stephania abyssinica abyssinica Jasminium, Jasminium sp.1, Jasminium sp.2, Oplismenus lirtellus, Pteris pterioides, Rhamnus prinoides, Chassalia subochreata, Pavetta rwandeensis, Keetia rwandensis, Clausena anisuta, Rubia cordifolia, apetalus Rubus, Rubus steudnerii, Allophyllus kivuensis, terminal Solanum Pneumatopteris afra, Rhoicissus tridentata* and *Afromomumlaurentii*. As for the herbaceous layer, there is a good representation of species like: *Achyranthes aspera, Rungia grandis, Panicum bravifolium, Cissampelos micronata, Microglossa pyrifolia*.

With that, we can say that the dynamics of the vegetation of the undergrowth in the plantations Eucalyptus has a progressive dynamic, because once abandoned, a forest formation can be observed in these plantations. This had already been observed by Iragi *et al.*, (2012) in a plant community near Lake Mugeri. The species of the *Rubiaceae* family also have a good representation in the undergrowth of the studied plantations (8 species), it is a good thing for these phytocenoses because the species in these families are characteristic of undergrowth in tropical areas

CONCLUSION

This work focused on the floristic study of undergrowth in two Eucalyptus plantations, specifically the planting of Mr. Jansen Lwiro and the Sisters of the Resurrection in Miti in Kabare territory. A floristic survey resulted in 148 belonging to 62 families. Among these families, the most important are the Poaceae, Fabaceae, Asteraceae, Rubiaceae, Malvaceae, Acanthaceae, Euphorbiaceae, Lamiaceae. The undergrowth of these plantations is dominated by woody plants (57.14%) with already a presence of species of mountain secondary forest (27.70%). The Phanerophytes species also dominate over other life forms.

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