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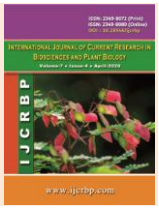

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Characterization of plant groups and description of plant succession in the sacred Kouoghap forest of the Batoufam village, West Cameroon

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ABSTRACT

The Batoufam village located in the mountaineous Western Region of Cameroon, forms part of the bioclimatic zone of the northern peripheral domain of the Guineo-Congolese region of Cameroon Guineo-Congolese phytogeographic region. This region is known for its bocager landscape. In this village, the Kouoghap gallery forest is remnants of the pioneer vegetation destroyed by man which has been conserved because of its sacred nature. This work is a phytosociological analysis of the Kouoghap forest and an assessment of its floristic affinities with other central Africa and Neotropical forest sites. The phytosociological analysis was based on the comparison of the 265 plant species lists within an area of 0.25-hestarest. The analyses of the floristic groupings have been made on the basis of the partition of the samples by Detrended Correspondence Analysis (DCA) and an Ascending Hierarchical Classification (CHA). The Kouoghap forest presents three major plant sets: the gallery forest, the rainforest and one of the various groupings. Two submontane forests were described as two plant associations: the *Synsepalum cerasiferum* ass. nov. of the forest galleries of the northern domain of the Guineo-Congolese region, and the *Tricalysietum macrophyllae* ass. nov. of the rainforest. The flora of Kouoghap counts a strong proportion of both the guineo - Congolese species (at least 51%) and Soudano-Zambezian (at least 13%).

Introduction

Batoufam (5°14'-5°18 N latitude and 10°26' -10°31' E longitude) is a village of the highlands of the Western Region of Cameroon. The survey site has an altitude of 1400-1500 m, at the northern limits of the dense continuous forest that covers the Cameroonian south plateau (Kuété, 1977), to the zone of confrontation of the two masses of air: the Mousson of the equatorial climate in the south and the Harmattan of the tropical climate in the north.

Though the phytogeographic aspect of different forests at the high summits have been studied (Noumi, 2013; Tchoua, 2013) as well as the photosociologic aspect (Noumi, 1998; Noumi and Amougou, 2003; Noumi, 2012) the summit forests remaindless explored. Koechlin and Trochain (1955)

described the succession the rainforest and the semi-deciduous forest without an intermediate stage of savanna, according to the climatic, edaphic and biotic local conditions.

The sacral Kouoghap forest situated on the southern slope of the valley between the Famla and Fieutchip quarters of the Batoufam village, drained by the Lioglok River, is a valley forest. It is an edaphic and physiographic grouping, because it benefits from a favorable microclimate due to the constriction of the sides of the valley. It is therefore a "gallery forest". This survey will permit to explore the sociology between the different types of plant formation and maybe to consider the hypothesis of the succession rainforest-gallery forest. This study is motivated by the fact that this forest is a representation of the vegetation of yesteryear in the highlands of the west Cameroon which has been destroyed by the human activities.

Materials and methods

Study area

Batoufam is nested in the south side of the Batoufam-Bayangam caldeira on a surface of 27 km². The cavity opens up to the North-east which by passes the rivers and tributaries of the Koupa that flows into the Noun River (Fig. 1).

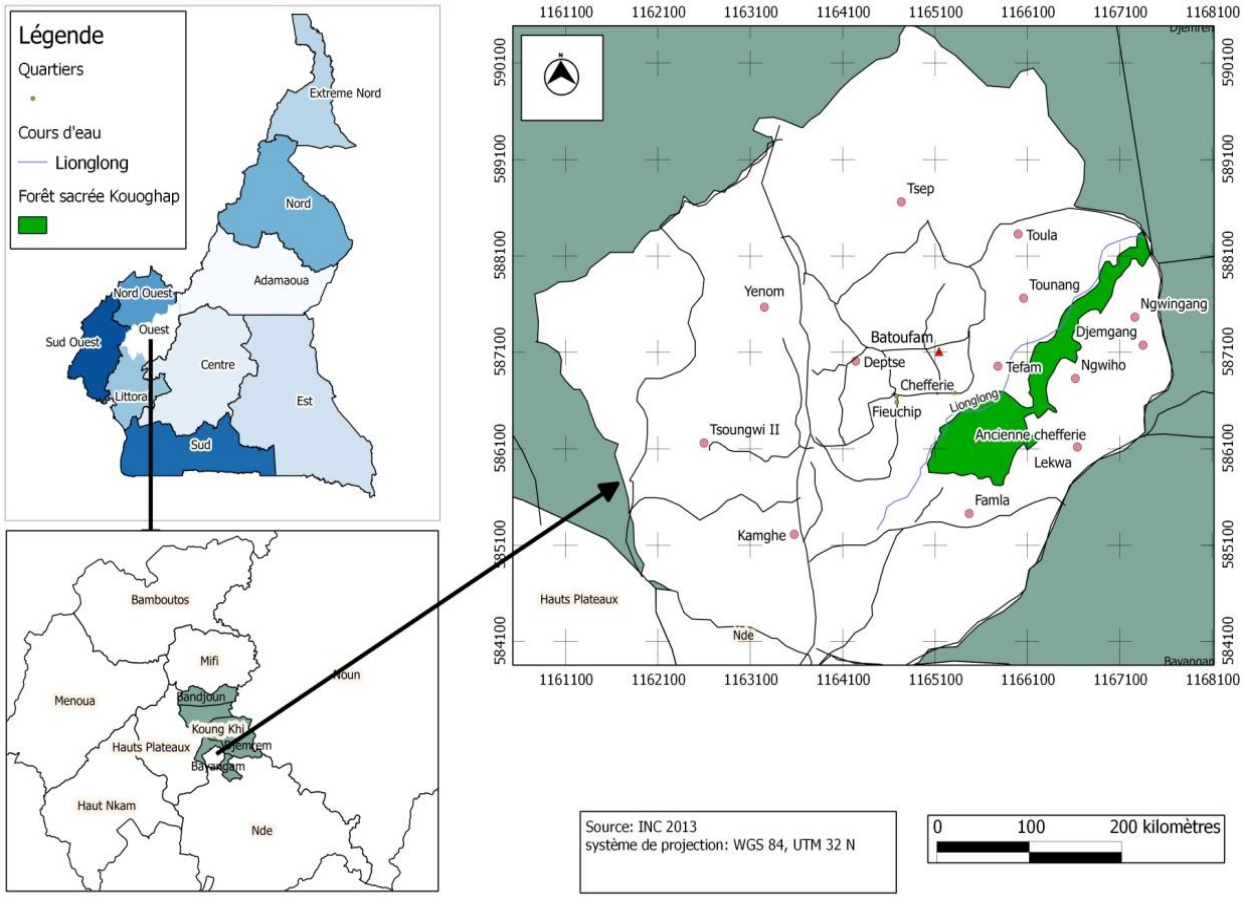

Fig. 1: Map of the location of Batoufam and the botanical landscape of the Kouoghap Forest.

Inside the caldeira three damaged terraces were established at an elevation of 1400, 1600 and 1800m, respectively (Fosso, 1999). They are separated by two layers eased by the erosion, of which the lowest (between 1400 and 1600m) is located in the Kouoghap Forest, on the south-eastern side. The Bangou volcano presents itself like an enormous stratovolcan whose lavas rest on a substratum constituted of intrusive granites in metamorphic formations (gneiss, migmatiques and matexites) belonging to the north equatorial Pan-African range (Nzenti et al., 1992). Ferruginous

soils have developed on the volcanic products, characterized more or less by the abundance of the fragments of deteriorating basalt (Tchoua, 1974; Njiki, 1984; Letouzey, 1968).

Batoufam belongs to the bioclimatic zone of the mountains and high lands of West Cameroon, the submountain domain of the Guinean-Congolese phytogeographic region (Letouzey, 1968). The temperatures are curbed and the thermal amplitudes are big (Ducret, 1990). The yearly average temperature is 19.32°C. The Bamiléké plateau is submitted to the humid wind (monsoon) coming from the Atlantic Ocean, and to the incursions of the tropical air of the Sahara (Harmattan). The meeting of these two masses of air forms the Inter Tropical Forehead (ITF) whose swing determines the cycle of the seasons. The yearly rainfall varies from 1238.3 to 1838 mm, with a yearly average of 1627.9 mm. The climate is tropical, with 2 seasons: a dry season from November to February and a season of the rains from March to October (Suchel, 1972) (Fig. 2).

The total population estimated to 30 000 is 99% native, practicing traditional agriculture for a living. The highland landscape presents summit hills covered with grassy savanna, then of the sacred woods, frequent in many concessions.

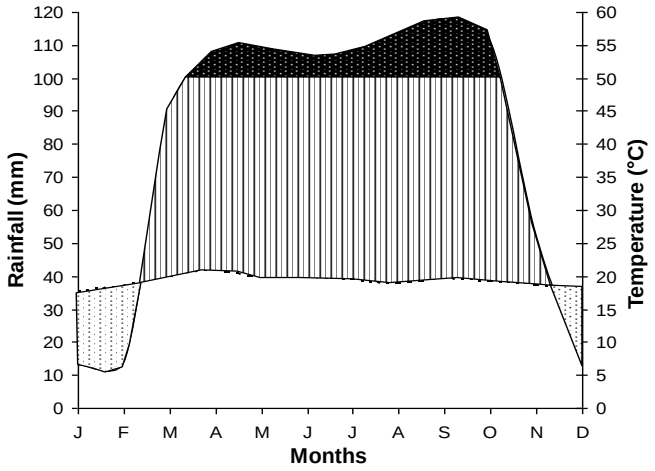

Fig. 2: Ombro-thermic diagram. Curve of the monthly mean of rainfalls [scale reduced to the 1/10 from100 mm, gray part, according to the method of Walter and Lieth (1964) and of the monthly mean of temperature. Data of the meteorological station of Bafoussam-Bamougoum, 1991 to 2012. There are no monthly mean values of precipitation and temperature in Batoufam, but these values must be nearest of those of Bafoussam-Bamougoum Station situated at 20 km of the North side. ▬ -Very humid period, over 100 mm; ▥ - Humid period; ▭ - Biologically dry period.

Methodology

The survey is sustained by the theory according to which " the visible elements of vegetation are the indicators that permit to have visions of the facts or phenomena that took place before the present stage (Noumi, 2008). A quantitative inventory of a 2.5-ha surface was achieved by rectangular plots (25 m of width on 100 m of length), taking into account all the vascular plant species (trees, herbs and lianas) in 2014-2015.

The determination of big tree, inaccessible at the harvests, was made in situ using the dendrological criteria (Normand, 1965; Vivien and Faure, 1985). The 45 samples harvested and dried were identified using some volumes of floras and documentation (Aubreville et al., 1961-1999; Aubreville et al., 1963-1998; Lebrun and Stork, 1191, 1992, 1995, 1997). Thereafter, the identified samples were compared with those specimens preserved at the National herbarium of Cameroon (YA), of the Ministry of the Scientific and Technical Research, for verification. The constituted herbaria were kept in the Laboratory of Plant Biology of the Higher Teacher Training College of the University of Yaoundé I.

The synthetic features of flora were considered in a synthetic manner through the main physiognomic spectra. The biologic types (BT) were distinguished according to many authors (Raunkiaer, 1934; Ellemberg and Mueller-Dombois, 1967; Boquet and Aeschimann, 1981; Schnell, 1971). The types of diaspores are determined using some classification (Danserau and Lems, 1957; Evrard, 1968).

Their phytogeographic distribution types (TP) were established according to the works for the inter-tropical massif orophytes (Schnell, 1970) for the big chorological subdivisions of Africa (White, 1983) and for the phytogeography of Cameroon (Letouzey, 1985). The phytosociologic units (PU) were based onsome classifications (Noumi, 1998; Lebrun and Gilbert, 1954; Schmitz, 1988). The coverage of the species has been established according to the Braun-Blanquet (Braun-Blanquet,

1932). To measure the specific diversity from a list of species and their number of individual partners, the Shannon index (*H'*) was used (Shannon and Weaver, 1949):

$$ISH = -\sum N_i/N \log_2 N_i/N$$

Where, Ni is the strength of the species "i" and N the strength of all species. It is expressed in bits.

After the encoding of the data from the software Excel 2007, the lists of the species thus established were treated in a suitable manner. The presences (P) and middle coverage (RM) of species were used like first criteria of ordering in order to establish the typology of the samplings.

The «Detrended Correspondence Analysis» (DCA) techniques was used for the treatment of the data, which is an improvement of the Correspondence Factorial analysis method (AFC), a method that permits us to regroup clouds of similar samplings and by species. The ordination of the samplings was done using the Two Way Indicator Species Analysis software (Twinspan) (Hill, 1994).

The ascending hierarchical classification (CAH) is a powerful analysis method that permitted us to regroup the objects following a matrix of distance (the similarity in our case) between these objects (the summaries in our case).

The dendrogram obtained from the ascending hierarchical classification (CAH) was with the help of the Multi-Variate Statistical Package (MVSP 3.22) software using the method of Ward on the basis of the distance of Bray-Curtis, clustering by UPGMA. The factorial plans are gotten with the software MVSP 3.22 on the basis of a DCA.

Results

Floristic composition

The sacral forest Kouoghap is a fragment of forest grouping of high cluster that developed on the south side of the valley crossed by the Lionlong River. It is both an edaphic and physiographic grouping because it benefits from a favorable microclimate due to the roadbed of the valley and to the tributary of Lionlong River (Fig. 3). These conditions are therefore favourable for a gallery forest, for the growth of the trees to very large sizes and height.

Fig. 3: Classic representation of the gallery forest. The canopy is contiguous above a tributary of the Lionlong River. The photography shows the fall of the tributary.

Of the 265 species harvested 255 have been identified (Table 1). The nomenclature follows Lebrun and Stork (1991-1997). The scientific name authors appear in the Table 1. These species regroup themselves in 192 genera and 82 families. The richest families are the *Leguminosae* (*Fabaceae, Caesalpiniaceae* and *Mimosaceae* disconcerted) represented by 30 species, the *Asteraceae* (13), *Euphorbiaceae* (12), *Moraceae* (11), *Meliaceae* (10), *Acanthaceae* (9), and *Rubiaceae* (9) (Fig. 4).

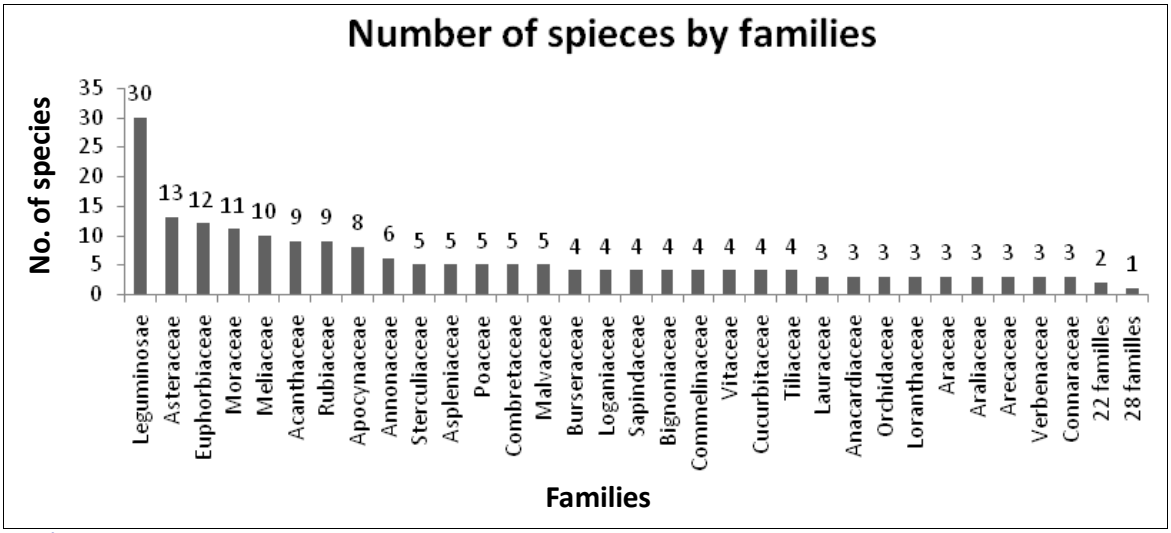

Fig. 4: Specific diversity of the families encountered in the floristic inventory of the Kouoghap gallery forest. The numbers of recorded species are indicated for each family.

The species in Kouoghap belong to 15 different biological types, and can be regrouped into 4 morphological types. There is dominance of the tree species (119, either 44.9%) that occupy the first place in the forest by their biomass, followed by the herbaceous species (66, either 24.9%). The proportion of the lianas (53 species, either 20%) is moderate, and the under-shrub and subfrutescentes (27, either 10.1%) are least represented.

Vertical structure and physiognomy

The plant formation is nearly represented by a pluri-stratum population of woody, reaching a height of 25-30 m. In the south side, the species as *Syncepalum ceraciferum* and *Canarium schweinfurthii*, rise above the forest and support climbing stems like *Entada giga*, *Dalbergia hostilis,* and *Cissus petiolata*. It is the stratum arborecent with *Lovoa trichilioides*, *Entandrophragma utile* and *Pitadeniastrum africanum*. The Table 1 presents the stratification of the Kouoghap forest. The shrubby stratum represents the most dominant stratum with 27.55% of the raw specter, followed by the herbaceous stratum with 21.51%. The epiphytes are the least represented with 3.4%. The arborescent stratum reaches 45.55% for the weighted spectrum.

Plant grouping individualization

The data correspond to a raw matrix of 10 samplings and 265 plant species. On Fig. 5, the dendrogram of the hierarchical classification of the samplings reveals the heterogeneity (associations and appearance) within a same plant formation.

Three plant groupings have been noticed:

- the group of the sampling corresponding to the gallery forest (in the sense of the world): samplings R1, R2, R6, R7 and R9;
- the group of the samplings corresponding at the rainforest (in the sense of the world): samplings R3, R4S, R5S and R8 S;
- the sampling R10 corresponding to the various plant groupings. The fieldwork done in the lower limit of the forest edged by a coffee plantation (*Coffea arabica, Rubiaceae*) and the Lionlong River.

The partition from that matrix of 10 samplings and 265 species, according to the axes 1 and 2, individualized the 3 groups of the dendrogramme:

- the group of the sampligs executed on the high and peripheral part of the forest (R1 R2, R6, R7, R9);
- the group of the samplings done on the slopes of the forest (R3, R4, R5, R8);
- The samplingwas done in the lower limit of the forest besides the coffee farms;
- The Fig. 6 illustrates the representation in the factorial plan 1 and 2 of the factorial analysis of the correspondences.

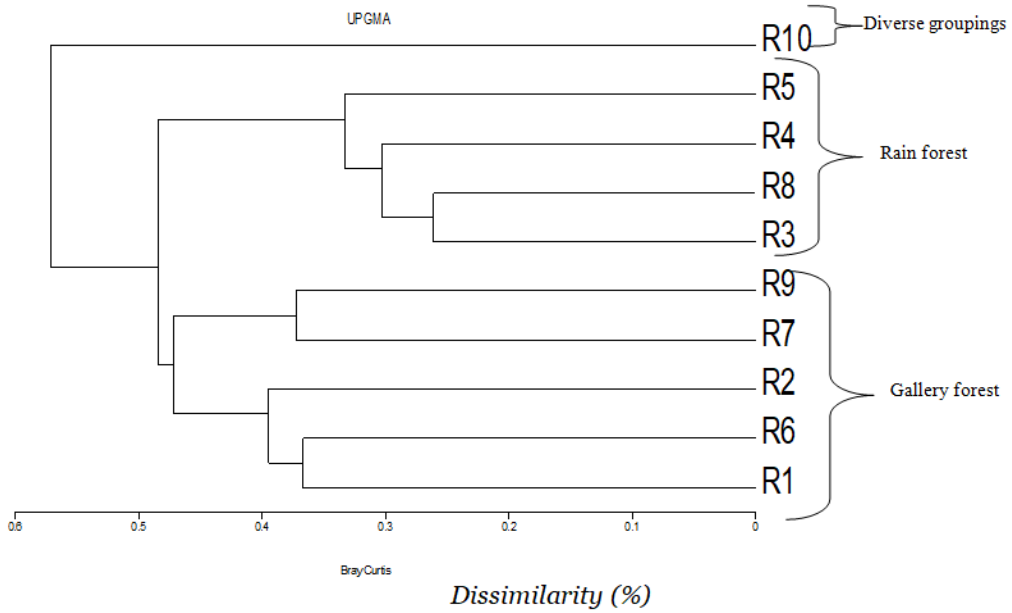

Fig. 5: Dendrogram of the plant formations of the sacral gallery Kouoghap forest (in the broad sense). V-gr: various plant groupings; G-f-sw: gallery forest in the stands of the world; R-f: rainforest.

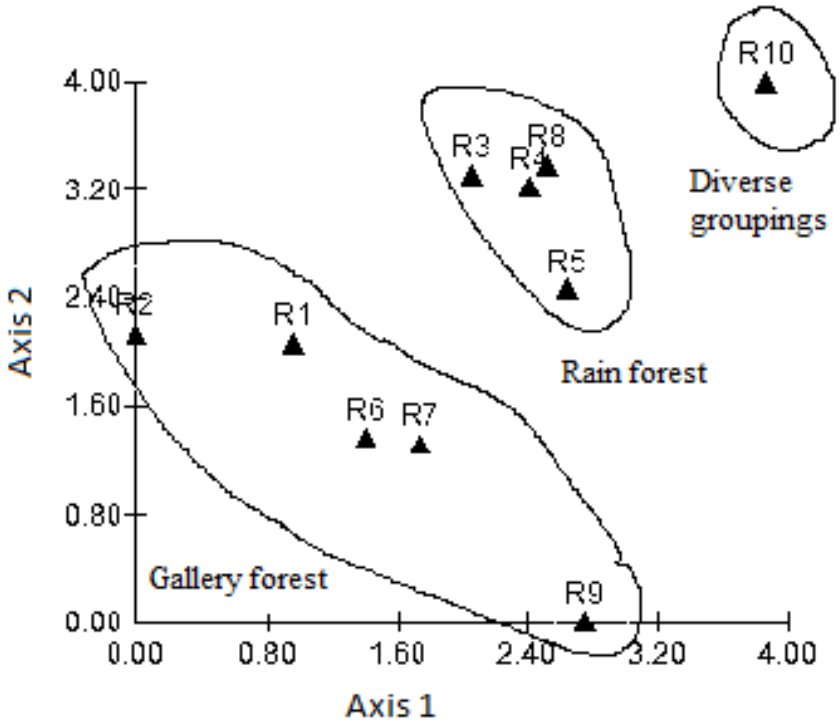

Fig. 6: Card of localization of the phytosociologic samplings; representation on the factorial plan 1 and 2 of the different groupings of the succession rainforest- gallery forest in the Kouoghap sylve.

The axis 1 symbolizes a hygometric pressure gradient in the same zone, even by the edaphic nature of the soil facing the depth of the water table (from the periphery of the drier forest, toward the river Lionlong, more humid place). The axis 2 represents the climatic phenomenon game in the neighborhood of the zone of instability of the 2 climatic regimes; equatorial climate with the

humid wind or monsoon (Guinean zone) and the tropical climate with the dry wind or Harmattan (Soudanian zone).

Feature of the different groups of samplings

The Table 1 gives the structural characteristics of the forests of the succession rainforest-gallery forest in the Kouoghap sylve (Letouzey, 1968; Hill, 1994). The specific richness of these groupings varies from 145 to 157 species. The Shannon diversity index varies from 4.72 to 5.62. The relative coverage of the groupings varies from 8 to 55%.

Table 1. Structural features of the formations in succession in the Kouoghap sacral forest.

Forest type	Localisation	Characteristic species	Species richness	Shannon diversity index (H')	Relative coverage average (%)
Gallery forest	Samplings done from the high slope toward the river Lionlong	*Amphimas pterocarpoïdes, Canarium schwenfurthii, Dacryodes macrophylla, Myrianthus arboreus, Syncepalum ceraciferum.*	147	4.74	55
Rain forest	Sampling done on the slope of the gallery forest	*Anonidium mannii, Alchornea floribunda, Carapa grandiflora, Lovoa trichilioides, Rauvolfia macrophylla, Tricalysia macrophylla.*	145	4.72	37
Various groupings with the transgressive species of the forests	Sampling adjoined the field of coffee culture before the river Lionlong	*Al bizia adianthifolia, Canarium schweinfurthii, Polyscias fulva, Pychnanthus angolensis, Markhamia tomentosa, Trilepisium madagascariense.*	157	5.62	8

Syntaxonomic position

The horizontal specific regrouping of 10 samplings (Table 1) permits to have sets of species corresponding appreciably to phytosociologic orders and classes, according to the zuricho-monpellierain system, and assimilatedto ecosociological groups.

- A first group constituted of the gallery forest species along the temporary Lionlong River. This group corresponds to the order of the *Pteygotetalia* Lebrun and Gilbert 1954. It is in fact the plants of semi-deciduous dense forests in more watered environment that compensates the pluviometric deficit by their proximity to the river. These species belong to the alliance of the *Khayo-Pterygotion* Schmitz 1950 for the Soudano-Zambezian formations. *Pteygotetalia* presents some semi- deciduous species of the equatorial mesophile forests (*Piptadeniastro-Celtidetalia*) (Letouzey, 1968; Letouzey, 1968; Hill, 1994); then the equatorial secondary forest species of the (*Musangeto-Terminalietea* Lebrun and Gilbert 1954), with species such as: *Synsepalum cerasiferum, Hylodendron gabunense, Guarea thompsonii, Amphimas pterocarpoïdes Lovoa trichilioides* and *Funtumia elastica*. This grouping represents the association of *Syncepalum ceraciferum*.

- A second honestly ombrophile set (class of the *Strombosio-Parinarietea* Lebrun and Gilbert 1954) includes the species of the sempervirentes rainforests. This taxon regroups 3 orders: The *Ficalhoeto-Podocarpetalia* Lebrun and Gilbert 1954, the *Gilbertiodendretalia dewevrei* Lebrun and Gilbert 1954 and the *Garcinietalia* Noumi 1998. In this last taxon, one notes the presence of the species of an alliance: the *Garcinion*

Noumi 1998 with *Draceana arborea, Garcinia smeathmannii, Tricalysia macrophylla*as indicator species. This grouping represents the association to *Tricalysia macrophylla*.

- A third set regroups several other phytosociologic groupings: the class of the *Mitragynetea* Schmitz 1963 that regroups all hygropile edaphic forests; the order of the *Oleo-Jasminetalia* Lebrun and Gilbert 1954 of the sclerophyll forests with *Canthium vulgare; Pittosporum mannii* and *Maytenus senegalensis* that are pledged to him. Still in the Kouoghap sacral forest, one meets the characteristic species of the *Musango-Terminalietea* Lebrun and Gilbert 1954, of the secondary forests of low and middle altitudes ; the characteristic species of the *Polyscietalia fulvae* Lebrun and Glibert 1954 of regrew and secondary forests of mountain; the characteristic species of the *Ruderali-manihotetea* Hoff & Brisse 1983 of ruderal groupings ; the characteristic species of the *Hyparrhenietea* Schmitz 1963 of the vegetations of the non steppe savanna in Soudano-Zambezian region.

Ecological spectra of the species of the Kouoghap gallery forest (in the broad sense)

Biological type spectra

The results of the analysis of the biological types of the forest (Table 6), are taken in the Table 2. The importance of the phanerophytes (76.98%) for the raw spectrum is put in evidence. This group is followed of therophytes (8.3%). Also the weighted specter is dominated by the phaneropytes that reaches 95.47% of the relative coverage. The two characteristic species: *Tricalysia macrophylla* and *Syncepalum serasiferum* represents 17.28% and 8.85% of the relative coverage of the association. The chamephytes and hemicryptophytes are least represented in terms of surface coverage.

Table 2. Biological type spectra.

Biological types		Raw spectrum		Weighted spectrum	
		No. of species	%	Coverage	%
Phanerophytes		204	76.98	208.55	95.47
	Microphanerophytes (Mcph)	65	24.53	56.05	25.66
	Phanerophyticlianas (Ph-L)	52	19.62	21.85	10.00
	Mesophanerophytes (Msph)	51	19.25	105.55	48.32
	Nanophanerophytes (Nnph)	36	13.58	25.10	11.49
Therophytes		22	8.30	1.4	0,64
	Therophytes erected (T-erec)	19	7.17	1.05	0.48
	Therophytic lianas (T-L)	3	1.13	0.35	0.16
Geophytes		18	6.41	5.65	2.58
	Rhizome-geophytes (G-rhiz)	11	4.15	4.85	2.22
	Root-budding geophytes (G-rad)	4	1.51	0.55	0.25
	Bulbous geophytes (G-bulb)	2	0.75	0.2	0.09
	Rhizome geophytes (hemi-epyphites) (G-rhiz-E)	1	0.38	0.05	0.02
Chamaephytes		13	4.91	17.0	0.78
	Chamephytes erected (Ch-erec)	9	3.40	1.35	0.62
	Chamephytes epiphytes (Ch-E)	4	1.51	0.35	0.16
Hemicryptophytes		8	3.02	1.15	0.52
	Caespitose hemicryptophytes (H-caesp)	4	1.51	0.35	0.16
	Hemicryptophytes epiphytes (H-E)	2	0.75	0.4	0.18
	Hemicryptophytes creeping	1	0.38	0.05	0.02
	Hemicryptophytes reptant (H-rept)	1	0.38	0.35	0.16
	Total	265	100	218.45	100

Phytogeographic type spectra

The detailed exam of type of the geographical distribution of the specific whole (Table 6) gave the groups and values encoded consigned in the Table 3. The Guineo-Congolese species group comes first for the raw specter (52.08%) of the specific whole and for the weighted specter (63.28% of the coverage). The following findings could be cleared:

- the floristic font of the formation is dominated by the Guineo-Congolese species.
- this type of plant formation is spilled in the Guinean zone in which meets the main species of the association.
- the extensively widespread species group poorly represented (15.85% of the raw specter), with only 7.82% of land coverage.

Table 3. Phytogeographic type spectra.

Phytogeographical type	Raw spectrum		Weighted spectrum	
	No. of species	%	Coverage	%
Guineo-congolese species	137	51.71	118.9	54.43
Omni- or subomni-guineo-congolese (G)	70.00	26.42	46.80	21.42
Centro-guineo-congolese (Cg)	66.00	24.91	71.95	32.94
Camerounian (Ca)	1.00	0.38	0.15	0.07
Widely spread species	44	16.6	39.85	18.26
Pantropical (Pan)	14.00	5.28	12.50	5.72
Afro-american (Aam)	9.00	3.40	1.00	0.46
Afro-malagasy (Am)	9.00	3.40	1.35	0.62
Afromountaneous (Amo)	5.00	1.89	0.45	0.21
Paleotropical (Pal)	3.00	1013	1.65	0.76
Pluri-regional african (Pra)	2.00	0.75	22.80	10.44
Afro-asian (Aas)	2.00	0.75	0.10	0.05
Species ofliaison	74	27.92	57.8	26.46
Afro-tropical (At)	38.00	14.34	24.50	11.22
Guineo-sudano-zambezian (G-Sz)	36.00	13.58	33.30	15.24
Indeterminated species	10.00	3.77	1.90	0.87
Total	265	100	218.45	100

Spectra of diaspore types

The Table 4 summarizes the results of the analysis of the types of diaspores as presented in the Table 6. The importance of the sarcochores for the raw specter (52.45%) and the weighted specter (71.30%) are put in evidence. The pterochores, is in the 4th position in the raw specter, and2nd in the weighted specter with 11.35%. The desmochores are the less represented with only 2.26% in the raw specter. The majority of the species is susceptible to be scattered by the animals.

Table 4. Diaspore type spectra.

Diaspore type	Raw spectrum		Weighted spectrum	
	No. of species	%	Coverage	%
Sarcochore (Sarco)	139	52.45	155.75	71.30
Ballochore (Ballo)	36	13.58	19.1	8.74
Sclerochore (Sclero)	30	11.32	3.6	1.65
Pterochore (Ptero)	27	10.19	24.8	11.35
Pogochore (Pogo)	18	6.79	12.5	5.72
Barochore (Baro)	9	3.40	2.4	1.10
Desmochore (Desmo)	6	2.26	0.3	0.14
Total	265	100	218.45	100

Ecosociological units

The results of the analysis of the ecosociological unit types of the species of the plant formation are presented to the Table 5. The groupings of the sempervirent ombrophile forests of the Table 6 show a total of 94 species (35.48%). They are followed by the groupings of the mesophile semi-caducifolious forests that present 53 species that is 20.37% of the set of the species. In the weighted spectrum, the species of ombrophile and secondary forests reach coverage of 73.47% of the total average coverage of the study area. In this context, the set of the species of the *Garcinietalia* to which belongs *Tricalysia macrophylla* reach a relative coverage of 23.27%. They largely determine the physiognomy of the Kouoghap sylva. The forest (*senso-stricto*) totals 17 species (6.42%), reaching a relative coverage of 13.48% that places it in the 3rd position of the relative coverage. *Syncepalum cerasiferum* belongs to this set described as plant association, whose species determine largely the evolutionary dynamic of the Kouoghap sylva.

Table 5. Ecosociological groups spectra.

Phytosociologic statute	Classes and Ordres	Raw spectrum		Weighed spectrum	
		No. of species	%	Coverage	%
Species of the sempervirente ombrophile forests		94	35.48	90.65	41.5
	Strombosio-Parinarietea (Strom)	24	9.06	16.65	7.62
	Gilbertiodendretalia dewevrei (Gilb)	32	12.08	16.05	7.35
	Ficalhoeto-Podocarpetalia (Fic)	10	3.77	6.9	3.16
	Garcinietalia (Gar)	28	10.57	51.05	23.37
Secondary forests		50	18.86	69.85	31.97
	Musango-Terminalietea (Mus)	44	16.6	58.55	26.80
	Polyscietalia fulvae (Polys)	6	2.26	11.3	5.17
Species of edaphic forests bound to the hydromorphe soils		14	5.29	8.75	2.56
	Mitragynetea (Mytra)	13	4.91	5.25	2.40
	Lanneo-Pseudospondietalia (Lan)	1	0.38	3.5	0.16
Species of mesophile semi - caducifolious forests		53	20.37	20.3	9.29
	Piptadeniastro-Celtidetalia (Pip)	43	16.6	19.35	8.86
	Oleo-Jasminetalia (Oleo)	10	3.77	0.95	0.43
Species of gallery forets		17	6.42	29.45	13.48
	Pterygotetalia (Ptery)	17	6.42	29.45	13.48
Cultural and postcultural vegetations		19	7.17	1.25	0.57
	Soncho-Bidentetea pilosi (Sonc)	19	7.17	1.25	0.57
Vegetations of the non steppic savannas in the region		16	6.04	1.55	0.71
	Hyparrhenietea (Hyppar)	16	6.04	1.55	0.71
Unsettled surrounding vegetations		2	0.75	0.1	0.05
	Ruderali-Manihotetea (Rud)	2	0.75	0.1	0.05
Vegetations of the large valleys funds and the lake sides		1	0.38	0.05	0.02
	Phragmitetea (Phrag)	1	0.38	0.05	0.02
Total		265	100	218.45	100

Study of the two forests in succession: gallery forest (in the sense of the world) of *Syncepalum cerasiferum* and forest confer (FC) sempervirent of *Tricalysia macrophylla*

Definition

The elements belonging to a type of forests maybe more or less sempervirent (forest CF sempervirent), developed during one more humid previous period, can be included currently in regrew forest that evolve toward the semi - deciduous forest (Koechlin and Trochain, 1955). The sempervirent forest is represented by the association of *Tricalysia macrophylla*; the semi-deciduous forest is represented by the association of *Synsepalum cerasiferum*. The topographic localization of the old elements on the flanks of valleys decorated to bring some arguments in favour of this thesis. The northern limit of the semi-deciduous forest of *Sterculiaceae* and *Ulmaceae* gives out long appendixes named

"gallery foresry". There, the forest population establishes itself of a more or less continuous and extended manner, on the flanks of the valleys (Letouzey, 1968.) The sacral Kouoghap sub-mountaneous forests, is a representative of the gallery forests of the northern peripheral domain of the Guineo-Congolese region.

Gallery forest of *Syncepalum cerasiferum* [Syn. *Afrosersalisia cerasifera* (Welw.) Aubr.]

Definition

The association of *Syncepalum ceraciferum* is a vegetation of high cluster, in succession in the sacral forest of the Batoufam village, situated on the south side of the valley between the Famla and Fieutchip quarters, in a fragment of gallery forest. It is surrounded by farming lands and *Terminalia glaucescens*, signifying the relics of the savannahs.

Phytosociologic study

Floristic composition: The floristic composition of the grouping forming the association to *Syncepalum cerasiforum* is given by 5 samplings (Table 1). The total number of species varies between 53 and 69 with an average of 62 species by sampling. The sampling type is represented by R1 and the characteristic of the association is *Syncepalum cerasiferum.*

Order of *Pterygotetalia*: From a physiognomic view point, Kouoghap is a forest grouping of high cluster that occupies the south flank of the valley drained by the Lionlong River. The formation benefits from a favorable macroclimate due to the constriction of the sides of this valley. These particular mesologic conditions make it as a vallicole forest. Lebrun and Gilbert (1954) defined the order of the Pterygotetalia Lebrun and Gilbert 1954, constituted of the species of dense semi-deciduous forest in more watered environment that compensates the pluviometric deficit by their proximity of the rivers. In several northern valleys in Cameroon, the presence of characteristic species of the order was raised (Letouzey, 1968): *Pterygota bequaerti* and *Pterygota macrocarpa*. We affiliate the association of *Syncepalum cerasifolium* to this phytosociologic order. A characteristic of the alliance of the *Khayo-Pterygotion* Schmitz 1950 (*Khaya grandifolia*), also reported (Letouzey, 1968), permit to affiliate the association of *Syncepalum cerasiferum* to this syntaxon. One rises in the association many elements descended of the various types of Guinean forests: caducifolious species as *Canarium schweinfurthii* and *Funtumia elastica;* secondary forest species as *Albizia adianthifolia, Pychnanthus angolensis* and *Hylodendron gabunense*; species of the sempervirent forests as *Strombosia grandifolia, Guarea thompsonii.* These species become quickly familiar to this northern zone.

Syncepalum cerasiferum (Sapotaceae) — Meso-phanerophyte, sarcochore: Species of the mountains and the forestry galleries of the northern peripheral domain of the guineo-congolian region, present from the of Fouta-Djalon mountanes in Guinea to the Republic Centrafrican, then in the south Hémispher in the Equatorial Guinea and Angola. It is signalled in the highlands of the West Cameroon and in the Adamaoua. It is a big tree, reaching 30 m of height and 70 cm of diameter. Stembark section pinkish exuding a white latex, gluing. The stem is cylindrical and right, without buttress to the basis. The deciduous leaves are in terminal tufts (Aubréville, 1964). Its coverage reaches up to 40.9%.

Ecological spectra of the species of the gallery forest of *Syncepalum cerasiferum*

The raw spectrum of the biological types of species of the forest gallery (sensus stricto) shows the predominance of the mesophanerophytes and microphanerophytes. The phanerophytes erected (trees and bushes) represent 61.9% of the total of the species, while the phanerophytic lianas 25.17%. The raw spectrum of the dissemination types of the diaspores of the species of the sempervirent forest shows the predominance of the sarcochories that represents 62.59% of the total of the species. The barochories and the pogonochories represent 4.76% respectively. The raw spectrum of the ecosociological groups of the species shows the predominance of the species of the mesophiles forests (Pip) and of the secondary forests (Mus). When one considers only the characteristic species of the gallery forest (strict sense), the species of the order of the *Pterygotetelia* Lebrun and Gilbert 1954 come in 5th position for the raw specter (9.52%) of the ecosociological types (Table 1).

Table 6. Synthesis of the phytosociologic samplings of the Kouoghap gallery forest (in the broad sense) of Cameroon, elaborated from the 10 sampling types of the succession forest CF sempervirent- gallery forest (in the sens of the world).

Families	BT	PT	DDT	EG	species	Strat	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	P	F
Ficalhoeto-Podocarpetalia, Lebrun and Gilbert 1954																		
Leguminosae	Msph	G-Sz	Baro	Fical	*Albizia gummifera* (J. F. Gmel) C. A. Sm.var. *gummifera*	T	1	+	+	+	+	+	+	+			8	80
Meliaceae	Msph	G	Sarco	Fical	*Carapa grandiflora* Sprague	T	2	1	1		2	1	2	+	+		8	80
Rubiaceae	Nnph	Ind	Sarco	Fical	*Cephaelis sp.*	s	+			+				+	+	+	5	50
Myrsinaceae	PhL	Cg	Sarco	Fical	*Ardisia kivuensis* Taton	l									+		1	10
Melianthaceae	Msph	Cg	Ballo	Fical	*Bersama abyssinica* Fres.	s			+		+				+		3	30
Leguminosae	PhL	Cg	Ballo	Fical	*Milletia pilosa* Hutch. & Daziel	l									+		1	10
Rosaceae	Msph	Pan	Sarco	Fical	*Prunus Africana* (Hook.f.) Kalkman	T	+										1	10
Araliaceae	PhL	G-Sz	Sarco	Fical	*Schefflera abyssinica* (Hochst. Ex A. Rich.) Harms	l	+									+	2	20
Araliaceae	PhL	G-Sz	Sarco	Fical	*Schefflera barteri* (Seem.) Harms	l										+	1	10
Asteraceae	Mcph	G	Sarco	Fical	*Vernonia blumeiodes* Hook. f.	s										+	1	10
Garcinietalia Noumi 1998																		
Orchidaceae	Ch-E	G	Sclero	Gar	*Ancystrorhynchus capitalus* (Lindl,) Summerh,	h			+				+				2	20
Acanthaceae	Ch -erec	G	Sclero	Gar	*Brillantaisia bauchiensis* Hutch. & Dalz.	h										+	1	10
Acanthaceae	Ch-erec	At	Sclero	Gar	*Brillantaisia vogeliana* (Nees) Benth,	h					+						1	10
Rutaceae	Mcph	Am	Sarco	Gar	*Clausena anisata* (Wills) Hook.f.ex Benth.	us									+	+	2	20
Sterculiaceae	Msph	Aam	Sarco	Gar	*Cola verticillata* (Thonn) Stapf ex A. Chev.	s		+	+					+			3	30
Asteraceae	T-erec	G	Pogo	Gar	*Crassocephalum mannii* (Hook. F.) L. Redh.	h										+	1	10
Asteraceae	T-erec	G	Pogo	Gar	*Crassocephalum rubens* (Juss. ex. Jacq.) S. Moore	h										+	1	10
Rubiaceae	Mcph	Cg	Sarco	Gar	*Tricalysia macrophylla* K. Schum.	T	4	3	3	3	2	3	3	3	3	3	10	100
Clusiaceae	Mcph	At	Sarco	Gar	*Garcinia smeathmannii* Oliv.	s	+			1	1	3	2	+	2		7	70
Dracaenaceae	Msph	Cg	Sarco	Gar	*Draceana arborea* (Willd.) Link.	T	2	2	+		+		+	+	+		7	70
Moraceae	Mcph	Cg	Sarco	Gar	*Ficus jansii* Boutique	s			+				+	+			3	30
Rubiaceae	Mcph	Cg	Sarco	Gar	*Gaertnea paniculata* Benth.	s			+	+					+	+	4	40
Clusiaceae	Mcph	G	Sarco	Gar	*Garcinia polyantha* Oliv.	T				+		+					2	20
Rosaceae	PhL	G-Sz	Sarco	Gar	*Rubus pinnatus* Willd.	l			+		+		+	+		+	5	50
Apiaceae	T-erec	Amo	Ptero	Gar	*Heteromorpha abyssinica* (R, Br,) Hochst.	h								+		+	2	20
Acanthaceae	Ch-erec	At	Ballo	Gar	*Hypoetes aristata* (Vahl) Saland.ex. Roem. & Schul.	h										+	1	10
Crassulaceae	Ch-erec	Pan	Sclero	Gar	*Kalanchoe crenata* (And.) Haw.	h										+	1	10
Malvaceae	Nnph	G-Sz	Ballo	Gar	*Kosteletzkya grantii* (Mast.) Garcke	us										+	1	10
Leguminosae	Nnph	G	Sarco	Gar	*Kotschya speciosa* (Hutch.) Hepper	us										+	1	10
Asteraceae	T-erec	G	Pogo	Gar	*Microglassa angolensis* Oliv. & Hiern	h										+	1	10
Boraginaceae	T-erec	Amo	Desmo	Gar	*Myosotis scorpioides*L.	h										+	1	10
Opiliaceae	T-erec	G-Sz	Sarco	Gar	*Opilia celtidifolia* (Guill. & Perr.) Engl.ex Walp.	us										+	1	10
Pittosporaceae	Mcph	G-Sz	Ballo	Gar	*Pittosporum mannii* Hook.f.	us				+				+		+	3	30
Pteridaceae	G-rhiz	G	Sclero	Gar	*Pteris togoensis* Hier.	h				+		+				+	3	30
Arecaceae	Mcph	G	Sarco	Gar	*Raphia farinifera* (Gaertn.) Hyl.	s		+	+								2	20
Ulmaceae	Mcph	At	Sarco	Gar	*Trema orientalis* (L.) Blume	s										+	1	10
Annonaceae	Mcph	Cg	Ballo	Gar	*Xylopia parviflora* (A. Rich.) Benth.	s			1							+	2	20
Annonaceae	Mcph	Cg	Sarco	Gar	*Xylopia rubescens* Oliv.	T			+		+						2	20

Families	**BT**	**PT**	**DDT**	**EG**	***species***	**Strat**	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**R7**	**R8**	**R9**	**R10**	**P**	**F**
Gilbertiodendretaliadewevrei, Lebrun and Gilbert 1954																		
Lauraceae	Mcph	Ca	Sarco	Gilb	*Beilschmiedia grandifolia* Rob.& Wilcz	s							+		+	+	3	30
Simaroubaceae	Nnph	Cg	Sarco	Gilb	*Brucea guineensis G.Don*	us										+	1	10
Vitaceae	PhL	At	Sarco	Gilb	*Cissus petiolata* Hook. f.	l		+	+	+				+	+		5	50
Ranunculaceae	PhL	At	Pogo	Gilb	*Clematis grandiflora* DC.	l							+			+	2	20
Cucurbitaceae	PhL	Aam	Sarco	Gilb	*Cyclanthera brachystachya* (Ser,) Cogn.	l			+	+						+	3	30
Sapindaceae	Mcph	Cg	Sarco	Gilb	*Deinbollia maxima* Gilg ex Radlk,	s										+	1	10
Euphorbiaceae	Mcph	Cg	Sarco	Gilb	*Drypetes molunduana* Pax & K. Hoffm.	s							+				1	10
Arecaceae	PhL	Cg	Sarco	Gilb	*Eremospatha wendlandiana* Dammer ex Becc.	l		+									1	10
Tiliaceae	Nnph	Am	Baro	Gilb	*Glyphaea brevis* (Spreng.) Monachino	us									+	+	2	20
Tiliaceae	Msph	G	Sarco	Gilb	*Grewia coriacea* Mast.	T			+			+					2	20
Meliaceae	Mcph	G	Sarco	Gilb	*Guarea glomerulata* Harms	T	+		+		+						3	30
Orchidaceae	G-bulb	G	Sclero	Gilb	*Habenaria gabonensis* Rchb.f.	h			+					+			2	20
Cucurbitaceae	PhL	G-Sz	Sarco	Gilb	*Kedrostis hirtella* (Naud.) Cogn.	l										+	1	10
Sterculiaceae	Nnph	At	Sarco	Gilb	*Octolepis casearia* Oliv.	s	+										1	10
Leguminosae	Msph	Cg	Baro	Gilb	*Pachyelasma tessmannii* (Harms) Harms	s				+	+			+			3	30
Aristolochiaceae	PhL	Cg	Sarco	Gilb	*Pararistolochia mannii* Hook.f.	l			+				+			+	3	30
Passifloraceae	PhL	Aam	Sarco	Gilb	*Passiflora edulis* Sims	l										+	1	10
Apocynaceae	PhL	At	Pogo	Gilb	*Pergularia daemia* (Forsk.) Chiov.	h										+	1	10
Loranthaceae	Nnph	Cg	Sarco	Gilb	*Phragmanthera capitata* (Spreng.) S. Balle	ep										+	1	10
Loranthaceae	Nnph	Cg	Sarco	Gilb	*Phragmanthera incana* (Schum.) Balle	ep			+	+				+		+	4	40
Loranthaceae	Mcph	Cg	Sarco	Gilb	*Phragmanthera kamerunensis* (Engl.) Balle	ep			+	+							2	20
Solanaceae	T-erec	G	Sarco	Gilb	*Physalis peruviana* L.	h										+	1	10
Rubiaceae	Nnph	Ind	Sarco	Gilb	*Psychotria* sp.	us	+		+		+	+	+	+			6	60
Rubiaceae	Nnph	Pan	Sarco	Gilb	*Psychotria vogeliana* Benth.	us	2	3	+		+	3	2	+			7	70
Icacinaceae	PhL	G-Sz	Sarco	Gilb	*Raphiostylis beninensis* (Hook.f.) Planch.ex. Benth.	l			+	+	+			+	1	+	6	60
Acanthaceae	PhL	Ind	Pogo	Gilb	*Rhinacanthus sp.*	l	+	1				+	+		+	+	6	60
Smilacaceae	PhL	At	Ptero	Gilb	*Smilax kraussiana* Meissn.	l	1	+	+	+		+		+	+	+	8	80
Menispermaceae	PhL	Cg	Sarco	Gilb	*Stephania dinklagei* (Engl.) Diels	l	+				+		+	+	+	+	6	60
Acanthaceae	Nnph	Cg	Ballo	Gilb	*Thomandersia laurifolia* (T. Anders.ex. Benth.) Baill	us		+		+	+			+			4	40
Meliaceae	Mcph	Aam	Sarco	Gilb	*Trichilia tessmannii* Harms	s								+			1	10
Meliaceae	Mcph	G	Sarco	Gilb	*Turraeanthus africanus* (Welw.ex DC.) Pellegr.	s						+	+		1	+	4	40
Annonaceae	Msph	G	Ballo	Gilb	*Xylopia staudtii* Engl. & Diels	s			+		+			+			3	30
Hyparrhenietea Schmitz 1963																		
Sapindaceae	PhL	Aam	Sarco	Hypar	*Cardiospermum halicacabum* L.	l										+	1	10
Leguminosae	Mcph	Aam	Ptero	Hypar	*Entada africana* Guill. & Perr.	s			+							+	2	20
Poaceae	H-caesp	At	Sclero	Hypar	*Hyparrhenia diplandra* (Hack.) Stapf	h										+	1	10
Hernandiaceae	PhL	At	Ptero	Hypar	*Illigera pentaphylla* Welw.	l					+				+		2	20
Hernandiaceae	PhL	At	Ptero	Hypar	*Illigera vespestilio*(Benth.) Baker f.	l				+					+	+	3	30
Verbenaceae	Nnph	At	Ptero	Hypar	*Lippia adoensis*(Hochst. ex Walp.)	us										+	1	10
Asteraceae	T-erec	At	Pogo	Hypar	*Microglossa pyrifolia* (Lam.) O. Ktze	h										+	1	10
Rubiaceae	T-erec	G	Sclero	Hypar	*Mitracapus scaber* Zucc.	h										+	1	10
Rubiaceae	PhL	Cg	Sarco	Hypar	*Mussaenda arcuata* Lam. ex Poir.	l							+			+	2	20

Families	**BT**	**PT**	**DDT**	**EG**	***species***	**Strat**	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**R7**	**R8**	**R9**	**R10**	**P**	**F**
Davalliaceae	G-rhiz	At	Sclero	Hypar	*Nephrolepis undulata* (Afzel. ex Sw.) J.Sm. var. undulata	h										+	1	10
Poaceae	H-caesp	Pan	Pogo	Hypar	*Pennisetum purpureum* Schumach,	h							+		+		2	20
Leguminosae	Nnph	At	Ballo	Hypar	*Pseudarthria hookerri* Wighter & Arn. var. hookeri	h										+	1	10
Poaceae	H-prost	Cg	Pogo	Hypar	*Setaria megaphylla (Steud.) T. Durand & Schinz*	h	+		+		+						3	30
Fabaceae	Nnph	G	Ballo	Hypar	*Tephrosia vogellii* Hook.f.	us			+							+	2	20
Euphorbiaceae	PhL	G	Sarco	Hypar	*Tragia senegalensis* Müll.Arg.	l										+	1	10
Poaceae	H-rept	Pan	Sclero	Hypar	*Oplismenus burmanii* (Retz) P. Beauv	h	+	+	+	+	+				+	+	7	70
Musango-Terminalietea, Lebrun et Gilbert 1954																		
Zingiberaceae	G-rhiz	G	Sarco	Mus	*Aframomum daniellii* (Hook.f.) K. Schum.	h	+	+	+	+	2	+	+	1	+	2	10	100
Bignoniaceae	Msph	G-Sz	Ptero	Mus	*Markhamia tomentosa* (Benth.) K. Schum.ex Engl.	s	3	2	3	2	2	2	1	2	2	+	10	100
Leguminosae	PhL	G	Ballo	Mus	*Acacia pennata* Wild.	l	3	2	+	+		2	2	+	2	1	9	90
Moraceae	Msph	Cg	Sarco	Mus	*Trilepisium madagascariense* DC.	T	2	1	2	2	2	1	2	2	1	1	10	100
Apocynaceae	Mcph	Cg	Sarco	Mus	*Rauvolfia macrophylla* Stapf	s	+	+	+	+		+	1	+	+	+	9	90
Apocynaceae	Msph	G-Sz	Pogo	Mus	*Funtumia africana* (Benth.) Stapf	s	2	1	2	3	1	2		2	+		8	80
Leguminosae	PhL	G-Sz	Ptero	Mus	*Dalbergia hostilis* Benth.	l		+	+	+		+		+	1	+	7	70
Vitaceae	PhL	G-Sz	Sarco	Mus	*Ampelocissus bombycina* (Bak.) Planch.	l		+				+				+	3	30
Araceae	G-rhiz	Aam	Sarco	Mus	*Anchomanes difformis* Engl.	h	+						+		+		3	30
Loganiaceae	Msph	G-Sz	Sarco	Mus	*Anthocleista schweinfurthii* Gilg.	T				+	+		+				3	30
Loganiaceae	Mcph	G	Sarco	Mus	*Anthocleista vogelii* Planch.	s			+								1	10
Costaceae	G-rhiz	G	Sarco	Mus	*Costus afer* Ker-Gawl	h			+							+	2	20
Costaceae	G-rhiz	G	Sarco	Mus	*Costus lucanusianus* J. Br. & K. Schum.	h										+	1	10
Fabaceae	PhL	G-Sz	Ballo	Mus	*Dalbergia saxatilis* Hook.	l			+	+	+					+	4	40
Dichapetalaceae	Mcph	Cg	Sarco	Mus	*Dichapetalum angolense* Chodat	s										+	1	10
Dioscoreaceae	G-rad	At	Ptero	Mus	*Dioscorea bulbifera* L.	l									+	+	2	20
Dioscoreaceae	G-rad	Ind	Ptero	Mus	*Dioscorea sp.*	l	+	+	+		+		+	+	+		7	70
Sterculiaceae	Msph	G	Ptero	Mus	*Dombeya buettneri* K. Schum.	T		+				+	+		+	+	5	50
Myrtaceae	Nnph	G	Sarco	Mus	*Eugenia afzelii* Engl.	us										+	1	10
Moraceae	Mcph	G	Sarco	Mus	*Ficus artocarpoïdes* Warb.	T			+		+			+			3	30
Moraceae	Msph	Pal	Sarco	Mus	*Ficus exasperata* Vahl	s			1		1		1	+	1		5	50
Moraceae	Mcph	G-Sz	Sarco	Mus	*Ficus natalensis* Hochst	s			+			+			+		3	30
Moraceae	PhL	Cg	Sarco	Mus	*Ficus ottoniifolia* (Miq.) Miq.	l		+	+	+	+				+	+	6	60
Moraceae	Msph	G-Sz	Sarco	Mus	*Ficus trichopoda* Bak.	s		+				+					2	20
Hypericaceae	Mcph	At	Sarco	Mus	*Harungana madagascariensis* Lam.ex Poit.	s		+								+	2	20
Lamiaceae	T-erec	G-Sz	Sclero	Mus	*Leucas maretinicensis* (Jacq.) Ait.f.	h										+	1	10
Acanthaceae	Nnph	G	Ballo	Mus	*Acanthus montanus* (Nees) T. Anders	h			+		+						2	20
Moraceae	Mcph	Cg	Sarco	Mus	*Milicia excelsa* (Welx.) C. C. Berg.	T		+		+							2	20
Cucurbitaceae	ThL	At	Sarco	Mus	*Momordica cissoïdes* Planch.ex. Benth.	l		+			+				+	+	4	40
Moringaceae	Mcph	Aas	Ballo	Mus	*Moringa oleifera* Lam.	s										+	1	10
Euphorbiaceae	Msph	Cg	Sarco	Mus	*Neoboutonia africana* Müll. Arg.	s	+										1	10
Leguminosae	Mcph	G	Ballo	Mus	*Pentaclethra macrophylla* Benth.	s						+			+		2	20
Lauraceae	Mcph	Aam	Sarco	Mus	*Persea americana* Mill.	T										+	1	10
Myrtaceae	Nnph	Pan	Sarco	Mus	*Psidium guajava* L.	s										+	1	10
Pteridaceae	G-rhiz	G	Sclero	Mus	*Pteris barombensis* Hier.	h					+			+			2	20

Families	**BT**	**PT**	**DDT**	**EG**	***species***	**Strat**	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**R7**	**R8**	**R9**	**R10**	**P**	**F**
Apocynaceae	Mcph	Cg	Sarco	Mus	*Rauvolfia africana*Afzl.	us				+	+						2	20
Apocynaceae	Mcph	G	Sarco	Mus	*Rauvolfia vomitoria* Afz.	s			+		+		+			+	4	40
Solanaceae	Nnph	G	Sarco	Mus	*Solanum aculeastrum* Dunal var. albifolium	s										+	1	10
Bignoniaceae	Msph	At	Ptero	Mus	*Spathodea campanulata* P. Beauv.	T							+	+			2	20
Dilleniaceae	PhL	G	Sarco	Mus	*Tetracera alniflolia* Willd. subsp. *alnifolia*	l		+			+	1	+			+	5	50
Dilleniaceae	Mcph	At	Sarco	Mus	*Tetracera micrantha* (Hochst.) Baillon	l						+			+		2	20
Rhamnaceae	PhL	G	Sarco	Mus	*Ventilago africana* Exell	l										+	1	10
Asteraceae	Mcph	Am	Pogo	Mus	*Vernonia conferta* Benth.	s	+	+				+		+	+		5	50
Asteraceae	Nnph	G	Pogo	Mus	*Vernonia richardiana* (O. Ktze) P.	us										+	1	10
Mitragynetea Schmitz 1963																		
Acanthaceae	Ch-erec	G	Sclero	Mytra	*Brillantaisia debilis* Burkill	h										+	1	10
Acanthaceae	Ch-erec	At	Sclero	Mytra	*Brillantaisia nitens* Lind.	h	+			+	+	+					4	40
Acanthaceae	Ch-erec-	G	Sclero	Mytra	*Brillantaisia owariensis* P. Beauv	h			+	+						+	3	30
Ochnaceae	Nnph	Cg	Sarco	Mytra	*Campylospermum flavum* (Schumach. & Thonn.) Farron	s			+	+	+						3	30
Asparagaceae	G-bulb	Amo	Ballo	Mytra	*Chlorophytum cf orcidastrum* Lindl.	h	+									+	2	20
Leguminosae	Mcph	G-Sz	Ballo	Mytra	*Erythrina senegalensis* DC.	s					+			+			2	20
Moraceae	Mcph	G	Sarco	Mytra	*Ficus mucuso* Ficalho	T			+	+							2	20
Phyllanthaceae	Nnph	Cg	Sarco	Mytra	*Hymenocardia heudelotii* Müll. Arg.	s										+	1	10
Anacardiaceae	Msph	G	Sarco	Mytra	*Lannea welwitschii* (Hiern) Engl.	T										+	1	10
Anacardiaceae	Msph	Am	Sarco	Mytra	*Pseudospondias microcarpa* (A. Rich.) Engl.	T				+	+				+	+	4	40
Sterculiaceae	Msph	Pra	Sarco	Mytra	*Sterculia tragacantha* Lindl.	s	1	+	+	1	1	+	2	1	1	1	10	100
Apocynaceae	PhL	Am	Pogo	Mytra	*Tylophora sylvatica* Decne	l		+	+	+		+			+	+	6	60
Arecaceae	Mcph	Pal	Sarco	Mytra	*Elaeis guineensis* Jacq.	s		+	+	+		+	+		+	+	7	70
Oleo-Jasminetalia Lebrun et Gilbert 1954																		
Athyriaceae	G-rhiz	Aas	Sclero	Oleo	*Athyrium schimperi* Moug, ex Fee	s				+							1	10
Rubiaceae	Mcph	Pan	Sarco	Oleo	*Canthium vulgare* (K. Schum.) Bullock	s	+		+								2	20
Vitaceae	PhL	G	Sarco	Oleo	*Cissus aralioides* (Welw.ex Bak.) Planch.	l	+								+	+	3	30
Ranunculaceae	PhL	Amo	Pogo	Oleo	*Clematis hirsuta* Guill. & Perr.	l			+	+						+	3	30
Burseraceae	Mcph	G-Sz	Sarco	Oleo	*Commiphora africana* (A. Rich.) Engl.	s										+	1	10
Oleaceae	T-erec	G-Sz	Sarco	Oleo	*Jasminum dichotomum* Vahl.	l			+							+	2	20
Poaceae	H-prot	G	Pogo	Oleo	*Rhynchelytrum repens* (Willd.) C.E. Bubbard	h										+	1	10
Orchidaceae	H-E	G	Sclero	Oleo	*Tridactyle tridactylites* (Rolfe) Schltr.	ep			+		+						2	20
Hypericaceae	Nnph	G	Sarco	Oleo	*Vismia rubescens*Oliv.	s				+						+	2	20
Cucurbitaceae	T-L	Pan	Sarco	Oleo	*Zehneria scabra* (L.f.) Sander	l						+				+	2	20
Phragmitetea Tüxen & Preising																		
Cyperaceae	G-rhiz	Am	Sclero	Phra	*Scleria racemosa subsp. Depressa* (CB. Cl) J. Raynal	h				+							1	10
Piptadeniastro-Celtidetalia																		
Connaraceae	PhL	Ind	Ballo	Pip	*Agelaea sp.*	l	+								+	+	3	30
Leguminosae	Msph	Cg	Ptero	Pip	*Amphimas ferrugineus* Pierre ex Pellegr.	T			+								1	10
Lomariopsidaceae	G-rhiz	Am	Sclero	Pip	*Bolbitis acrostichoides* (Afz. ex Sw,) Ching	h	+		+		+						3	30
Celtidaceae	Mcph	G	Sarco	Pip	*Celtis gomphophylla* Bak.	T				+			+		+	+	4	40
Celtidaceae	Mcph	Cg	Sarco	Pip	*Celtis integrifolia* Lam.	s										+	1	10

Families	**BT**	**PT**	**DDT**	**EG**	***species***	**Strat**	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**R7**	**R8**	**R9**	**R10**	**P**	**F**
Sapotaceae	Msph	Ind	Sarco	Pip	*Chrysophyllum* sp.	s	+										1	10
Connaraceae	PhL	G	Sarco	Pip	*Cnestis ferruginea* DC.	us	+	+	+								3	30
Connaraceae	PhL	G	Sarco	Pip	*Cnestis urens* Gilg.	us	+								+		2	20
Sterculiaceae	Mcph	Cg	Sarco	Pip	*Cola acuminata* (P. Beauv.) Schott. & Engl.	s									+	+	2	20
Combretaceae	PhL	G	Ptero	Pip	*Combretum dolichopetalum* Engl. & Diels	l			+	+						+	3	30
Combretaceae	PhL	G-Sz	Ptero	Pip	*Combretum hispidum* Laws	l	+								+	1	3	30
Combretaceae	PhL	Cg	Ptero	Pip	*Combretum hypopilinum* Diels	l										+	1	10
Combretaceae	PhL	At	Ptero	Pip	*Combretum paniculatum* Vent	l		2									1	10
Combretaceae	PhL	Ind	Ptero	Pip	*Combretum* sp.	l					+			+			2	20
Leguminosae	Msph	At	Baro	Pip	*Copaifera mildbraedii* Harms	T				+	+			+			3	30
Vitaceae	Mcph	At	Sarco	Pip	*Cyphostemma adenocaule* (Steud.) Descoing	l										+	1	10
Leguminosae	PhL	Cg	Baro	Pip	*Entada gigas* (L.) Fawcett & Rendle	l	+		+	+	+			+	+		6	60
Meliaceae	Msph	Cg	Ballo	Pip	*Entandrophragma utile* (Dawe & Sprague) Sprague	T								+	+		2	20
Samydaceae	Msph	Cg	Sarco	Pip	*Homalium dolichophyllum* Gilg	s										+	1	10
Verbenaceae	Msph	Cg	Sarco	Pip	*Vitex grandifolia* Gürke	s	1	+	1	+	1	+	2	1	2	1	10	100
Apocynaceae	PhL	G-Sz	Sarco	Pip	*Landolphia owarensis* P. Beauv.	l	+		+	+	+	+	+	+	+	+	9	90
Meliaceae	Msph	G	Sarco	Pip	*Trichilia rubescens* Oliv.	s		+	2	2	1	1	2	+			7	70
Ochnaceae	Mcph	G	Sarco	Pip	*Ochna afzelii* R. Br.ex Oliv.	s	+	+	+		+	+			+	+	7	70
Leguminosae	Mcph	At	Ballo	Pip	*Hymenostegia breteleri* Aubr.	T	1		+	+		1	+	+	+		7	70
Lauraceae	Mcph	Cg	Sarco	Pip	*Hypodaphnis zenkeri* (Engl.) Stapf	s		+	+	+		+	+			+	6	60
Asteraceae	Th(erec)	G	Pogo	Pip	*Lactuca capensis* Thunb.	h										+	1	10
Sapindaceae	Msph	G	Sarco	Pip	*Lecaniodiscus cupanioides* Planch.ex Benth.	T			+						+	+	3	30
Euphorbiaceae	Mcph	G	Sarco	Pip	*Mallotus oppositifolius* (Geisel) Müll. Arg.	s						1			1		2	20
Bignoniaceae	Mcph	G	Ptero	Pip	*Markhamia lutea* (Benth.) K. Schum.	s			1	+	+		+				4	40
Annonaceae	Mcph	G-Sz	Sarco	Pip	*Monodora myristica* Gaertn. Dunal	s			+		+		1		+	+	5	50
Cecropiaceae	Msph	G	Sarco	Pip	*Myrianthus arboreus* P. Beauv.	s										+	1	10
Commelinaceae	Ch-erec	Cg	Sclero	Pip	*Palisota ambigua* (P. Beauv.) C. B. Cl.	h	+	1				+	+		+	+	6	60
Leguminosae	Msph	Cg	Baro	Pip	*Parkia bicolor* A. Chev.	s		+					+			+	3	30
Piperaceae	Nnph	G-Sz	Sarco	Pip	*Piper capense* L.	h				+	+		+			+	4	40
Piperaceae	PhL	Pan	Sarco	Pip	*Piper umbellatum* L.	h							+			+	2	20
Leguminosae	Msph	G	Ptero	Pip	*Piptadeniastrum africanum* (HooK. f.) Brenan	T		+	+	+	+			+			5	50
Polypodiaceae	G-rhiz-E	At	Sclero	Pip	*Platycerium angolensis* Welw.ex. Hooker	ep			+								1	10
Leguminosae	Mcph	Cg	Ptero	Pip	*Pterocarpus mildbraedii* Engl.	T					+			+			2	20
Leguminosae	Msph	G	Ptero	Pip	*Pterocarpus soyauxii* Taub.	T										+	1	10
Euphorbiaceae	PhL	Cg	Sarco	Pip	*Sapium cornutum var. Cociaceum Pax*	l	+					+			+		3	30
Meliaceae	Msph	G	Sarco	Pip	*Sorindeia grandifolia* Engl.	us							+	+	+		3	30
Anacardiaceae	Nnph	Ind	Sarco	Pip	*Sorindeia* sp.	s									+		1	10
Rutaceae	Mcph	Cg	Sarco	Pip	*Teclea afzelli* Engl.	s						+	+				2	20
Polyscietalia fulvae Lebrun et Gilbert 1954																		
Alangiaceae	Mcph	Pal	Sclero	Polys	*Alangium Chinense* (Lour.) Harms	s				+							1	10
Euphorbiaceae	Msph	G	Ballo	Polys	*Croton macrostachyus* Hochst ex Del.	T				+	+		+			+	4	40
Rhamnaceae	PhL	At	Ptero	Polys	*Gouania longipetala* Hemls.	l		+		+	+	+			+	1	6	60
Euphorbiaceae	Msph	G	Sarco	Polys	*Macaranga occidentalis* (Müll. Arg.) Müll. Arg. & Serr	s	+	1	+	+		+	+	+	+	2	9	90
Araliaceae	Msph	At	Sarco	Polys	*Polyscias fulva* (Hiern.) Harms	T	1		1	3	2	1	1	1	+	2	9	90
Myrsinaceae	Mcph	Am	Sarco	Polys	*Maesa lanceolata* Forsk.	s										+	1	10

Families	**BT**	**PT**	**DDT**	**EG**	***species***	**Strat**	**R1**		**R2**	**R3**	**R4**	**R5**	**R6**	**R7**	**R8**	**R9**	**R10**	**P**	**F**
Pterygotetalia Lebrun and Gilbert 1954																			
Leguminosae	Msph	Aam	Ballo	ptery	*Albizia adianthifolia* (Schum) W. F. Wight	T		+		+	+			+	+		5	50	
Leguminosae	Mcph	G-Sz	Baro	Ptery	*Albizia zygia* (DC.) J. F. Macbr.	s		+		+			+	+	+	+	6	60	
Leguminosae	Msph	Cg	Ballo	Ptery	*Amphimas pterocarpoïdes* Harms	T	+		+	+	+		+		+		6	60	
Sapotaceae	Msph	Pra	Sarco	Ptery	*Synsepalum cerasiferum* (Welw.) TD. Penn. PRA	T	3	2	3	2	1	2	2	3	2	1	10	100	
Meliaceae	Msph	Cg	Ballo	Ptery	*Lovoa trichilioides* Harms	T			2	1	1	+	+	2	+	+	8	80	
Leguminosae	Msph	Cg	Ptero	Ptery	*Hylodendron gabunense*Taub.	T		1	+	+	+		1		+	+	7	70	
Burseraceae	Msph	Cg	Sarco	Ptery	*Canarium schweinfurthii* Engl.	s	1			+	+	+	+	+		+	7	70	
Commelinaceae	G-rhiz	Cg	Sclero	Ptery	*Palisota barteri* Hook.f.	h	+		+	+	+		+	+	+		7	70	
Meliaceae	Msph	At	Sarco	Ptery	*Guarea thompsonii* Sprague & Hutch	T		2	1	+	+	+		+			6	60	
Burseraceae	Mcph	Cg	Sarco	Ptery	*Dacryodes macrophylla* (Oliv.) Lam.	T								+			1	10	
Caesalpiniaceae	Msph	G-Sz	Ballo	Ptery	*Erythrophleum ivorense* A. Chev.	T				+				+			2	20	
Apocynaceae	Mcph	At	Pogo	Ptery	*Funtumia elastica* (Preus) Stapf	T			+								1	10	
Euphorbiaceae	Mcph	Cg	Baro	Ptery	*Microdesmis puberula* Hook.f. ex Planch.	s							+				1	10	
Myristicaceae	Msph	Pan	Sarco	Ptery	*Pychnanthus angolensis* (Welw.) Warb.	T			+	+	+			+	+		5	50	
Olacaceae	Msph	Cg	Sarco	Ptery	*Strombosia grandifolia* Hook.f. ex Benth.	T			+	1	+			+	+		5	50	
Annonaceae	Mcph	G	Ballo	Ptery	*Xylopia aethiopica* (Dunal) A. Rich.	us			+	+			+	1			4	40	
Commelinaceae	Ch-erec	G	Sarco	ptery	*Palisota hirsuta* (Thun.) Schum ex Engl.	h	+		+	+	+						4	40	
Ruderali-Manihotetea emendit Hoff and Brisse 1983																			
Euphorbiaceae	G-rad	Pan	Ballo	Rude	*Manihot esculenta* Crantz	Us										+	1	10	
Malvaceae	Nnph	Pan	Ballo	Rude	*Urena lobata* L.	us										+	1	10	
Soncho- Bidentetea pilosi Hoff, Brisse and Grandjouan (1983) 1985																			
Asteraceae	T-erec	Pan	Desmo	Sonc	*Ageratum conizoides* L.	h										+	1	10	
Asteraceae	T-erec	G	Pogo	Sonc	*Aspilia africana* (Pers.) C. D. Adams	h										+	1	10	
Asteraceae	T-erec	Cg	Desmo	Sonc	*Aspilia helianthoïdes subsp.Prieuriana* (DC.) DC.	h										+	1	10	
Asteraceae	T-erec	Cg	Desmo	Sonc	*Aspilia spenceriana* Muschl.	h										+	1	10	
Leguminosae	Nnph	G-Sz	Ballo	Sonc	*Cassia floribunda* Cav.	us										+	1	10	
Commelinaceae	H-rept	At	Sclero	Sonc	*Commelina africana*L.	h										+	1	10	
Leguminosae	T-erec	G-Sz	Ballo	Sonc	*Crotalaria elonifolia*	h										+	1	10	
Leguminosae	Nnph	G-Sz	Ballo	Sonc	*Crotalaria pallida* Ait.	h										+	1	10	
Leguminosae	Nnph	G-Sz	Ballo	Sonc	*Crotaria hyssopifolia* Klotzsch.	h										+	1	10	
Apiaceae	T-erec	Amo	Ptero	Sonc	*Heteromorpha arborescens* Cham. & Schlest Adam	h										+	1	10	
Malvaceae	Nnph	G-Sz	Desmo	Sonc	*Hibiscus congestiflorus* Hochr.	us										+	1	10	
Malvaceae	Nnph	Ind	Desmo	Sonc	*Hibiscus* sp.	us										+	1	10	
Convolvulaceae	G-rad	G-Sz	Sclero	Sonc	*Ipomoea involucrata* P. Beauv.	h										+	1	10	
Sapindaceae	PhL	At	Ballo	Sonc	*Paullinia pinnata* L.	l	+			+		+	+		+	+	6	60	
Phyllanthaceae	T-erec	At	Sclero	Sonc	*Phyllanthus pentendrus* Schumach & Thonn.	h										+	1	10	
Malvaceae	Nnph	G	Sclero	Sonc	*Sida ovata* Forsk.	h										+	1	10	
Tiliaceae	Nnph	G	Sarco	Sonc	*Triumfetta cordifolia* A. Rich.	us										+	1	10	
Tiliaceae	Nnph	G	Sarco	Sonc	*Triumfetta rhomboidea* Jacq.	us			+							+	2	20	
Leguminosae	TL	Ind	Ballo	Sonc	*Vigna* sp.	h										+	1	10	
Strombosio-Parinarietea Lebrun and Gilbert 1954																			
Euphorbiaceae	Mcph	At	Ballo	Strom	*Alchornea floribunda* Müell. Arg.	s								+			1	10	
Annonaceae	Mcph	Cg	Sarco	Strom	*Anonidium mannii* (Oliv.) Engl. & Diels.	T						+					1	10	

Families	**BT**	**PT**	**DDT**	**EG**	***species***	**Strat**	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**R7**	**R8**	**R9**	**R10**	**P**	**F**
Aspleniaceae	Ch-E	At	Sarco	Strom	*Asplenium africanum* Desv.	ep				+							1	10
Aspleniaceae	Ch-E	At	Sclero	Strom	*Asplenium buettneri* Hier. Ex Brause	ep			+		+						2	20
Aspleniaceae	Ch-E	G-Sz	Sclero	Strom	*Asplenium nidus* L.	ep	+					+					2	20
Euphorbiaceae	Msph	G-Sz	Sarco	Strom	*Bridelia micrantha* (Hochst) Baill.	s	+					+					2	20
Meliaceae	Mcph	G	Sarco	Strom	*Carapa procera* DC.	s			+	+	+		+	+			5	50
Verbenaceae	PhL	At	Ptero	Strom	*Clerodendrum paniculatum* Vent.	l	1			+					+		3	30
Asteraceae	PhL	Cg	Ballo	Strom	*Coreopsis parviflora* Jacq.	l										+	1	10
Rubiaceae	Nnph	Cg	Sarco	Strom	*Cremaspora triflora* (Thonn.) K. Schum.	l					+	+			+	+	4	40
Araceae	PhL	Cg	Sarco	Strom	*Culcasia obliquifolia* Engl.	h			+					+			2	20
Araceae	PhL	Cg	Sarco	Strom	*Culcasia tenuifolia* Engl,	h						+				+	2	20
Burseraceae	Msph	Cg	Sarco	Strom	*Dacryodes igagangaA*ubr. & Pellegr.	T									2	+	2	20
Dracaenaceae	Nnph	G	Sarco	Strom	*Draceana deisteliana* Engl.	s	3	2	1	2	1	2	1	2	1	1	10	100
Euphorbiaceae	Msph	Pan	Baro	Strom	*Sapium ellipticum* (Hochst.) Pax	T			+		+	+	+		+	1	6	60
Aspleniaceae	H-E	Cg	Sclero	Strom	*Asplenium biaframum*	ep	+	+	+	+		+			+		6	60
Moraceae	Mcph	Cg	Sarco	Strom	*Ficus abscondita* C. C. Berg.	s					+	+		+	+		4	40
Moraceae	Mcph	G	Sarco	Strom	*Ficus thonningii* Blume	s			+	+			+				3	30
Leeaceae	Nnph	G	Sarco	Strom	*Leea guineensis* G. Don	us							+		+	+	3	30
Celastraceae	Mcph	G-Sz	Sarco	Strom	*Maytenus senegalensis* (Lam.) Exell	s										+	1	10
Bignoniaceae	Msph	Cg	Ptero	Strom	*Stereospermum acuminatissimum* K. Schum	T	+	1	+				+				4	40
Olacaceae	Mcph	Am	Sarco	Strom	*Strombosia pustulata* Oliv.	s	+	+	+								3	30
Loganiaceae	PhL	Cg	Sarco	Strom	*Strychnos boonei* De Wild.	l			+		+	+	+				4	40
Loganiaceae	PhL	Cg	Sarco	Strom	*Strychnos floribunda* Gilg.	l							+		+		2	20
							60	53	97	80	76	60	69	68	85	157		

BIOLOGICAL TYPES (TB): Msph = mesophanerophytes; Mcph = microhanerophytes; Nnph = nanophanerophytes; PhL = phanerophytic Liana; T-erec = Therophytes erected; TL = TherophytcLianas; G-rhiz = Rhizome-geophytes; G rad= Root-budding geophytes (radicigemma = rad); G bulb = Bulbous geophytes; G rhizE = rhizome-geophytes (hemi-epiphytes); Ch-erect = Chamephytes erected; Ch E = Chamephytes epiphytes; H caesp = Caespitose hemicryptophytes; H E = Hemicryptophytes epiphytes; H rept = Reptant hemicryptophytes; H-prost = Hemicryptophytes prostrated;

TYPES OF DISSEMINATION OF THE DIASPORES (TD): Ballo = Ballochories (diaspores thrown out by the plant itself); Baro = Barochories (diaspores non fleshy, heavy); Pogo = pogonochories (diaspores with feathery or silky appendixes); Ptero) Pterochories (diapores provided of wing-dispersal appendixes); Sarco = sarcochories (diaspores totaly or partially fleshy); Sclero = sclerochories (non fleshy diaspores, relatively light).

ECOSOCIOLOQIC GROUPS (EG): Fical = *Ficalhoeto-Podocarpetalia* Lebrun and Gilbert 1954; Gar = *Garcinietalia* Noumi 1998; Gilb = *Gilbertiodendretaliadewevrei* Lebrun and Gilbert 1954; Hypar = *Hyparrhenietea* Schmitz 1963; Mus = *Musango-Terminalietea* Lebrun and Gilbert 1954; Mytra = *Mitragynetea* Schmitz 1963; Oleo = *Oleo-Jasminetalia* Lebrun and Gilbert 1954; Pip = *Piptadeniastro-Celtidetalia* Lebrun and Gilbert 1954; Polys = *Polyscietalia fulvae* Lebrun and Gilbert 1954; Ptery = *Pterygotetalia* Lebrun and Gilbert 1954: Rude = *Ruderali-Manihotetea* emendit Hoff and Brisse 1983; *Phragmitetea* Tüxen and Preising 1942; Sonc = *Soncho-Bidenteteapilosi* Hoff, Brisse and Grandjouan (19833) 1985; *Strombosio-Parinarietea* Lebrun and Gilbert 1954.

PHYTOGEOGRAPHIC TYPES (TP): Aam = Afro-Malagasy; Am = Afro-America; Amo = Afromountaneous; At = tropical Africa; Ca = Endemic Cameroonian; Cg = Cento-Guineo-Congolian; G = Omni or subomni-Guineo-Congolian; G-Sz = Guineo-Sudano-Zambezian; Pal = Paleotropical; Pant = Pantropical.

STRATUM TYPES: Strat = stratum; T = Tree; a = shrub; us = under shelter; h = herbaceous; l = liana; ep = epiphyte.

Ombrophile forest of *Tricalysia macrophylla*

Definition

The grouping of *Tricalyia macrophylla* is an arborescent forestry vegetation, submountaneous, present in the Kouoghap sacral forest and also in the Guinean zone, in particular in Côte d'Ivoire, Togo, Nigeria and Gabon (Hallé, 1966). The floristic composition is given by 4 samplings (R3, R4, R5 and R8) (Table 1). It is enough provided with plant species (145 species). The total number of species varies between 68 and 97 with an average of 97 species by sampling. The sampling type is represented by R3 and the characteristic of the association is *Tricalysia macrophylla*.

Composition of floristics

Tricalysia macrophylla K. Schum., Syn.: *Tricalysia pluriovulata* K. Schum., (*Rubiaceae*). The species reaches 10 to 15 m of height and 0.30 m of diameter in the dition; Fluted irregular trunk and contreforts; Leaf stalk pubescent in the juvenile stage. The limb is olive in colour, the barefaced grey, with an elliptic to oblong, form measuring 14-23 × 4-8 cm. Inflorescences occurs in small clusters of cymes, 10 floras or more, branched out from the the base. Globular fruits, of 5 mm of diameter, barefaced. Fruits are with thin pericarp, about thirty angular brown blackish seeds of 3.5 mm (Hallé, 1966). This species of forest reaches the biggest measurements met in the genus. The synthetic features in this association are: presence (100%) and relative coverage (37.75%).

Association-mate species: *Draceana deisteliana* and *Psychotria vogeliana*.

Ecological spectra of the species of the gallery forest of *Syncepalum cerasiferum*

The raw spectrum of the biological types of the species of the forests shows the predominance of the mesophanerophytes: 26.89% of the species. The nanophanerophytes only represents 8.96% of the species and the phanerophytic lianas 17.93% of species. Two hemicriptophytes are signalled. The spectrum of the dissemination types of the diaspores of the sempervirent orest shows the predomination of the sarcochories that represents 53.10% of the species. The barochories and the pogonochories are leact represented, respectively with 0.68% of species.

The raw spectrum of the ecosociological groups of species shows the predominance of the species of the low and middle altitude forests. When one considers the two orders solely (order of the *Pterygotetalia* Lebrun and Gilbert 1954 and of order of the *Garcinietalia* Noumi 1998) of which come out the characteristic species of the two associations described, their raw specters make 22.06% of species. They don't dominate the raw spectrum of the ecosociological group's of the Kouoghap sylve (Table 1).

Discussion

The analysis of the phytogeographical distribution of the specific whole of this forest shows the dominance of the species belonging to the Guineo-Congolese flora. The species of the sub-element omni-Guineo-Congolese are better represented. The most widespread diaspore types in the inventory are the Sarcochory of most plants of the arborescent stratum and the undergrowth (Evrard, 1968). The examination of biological types revealed the predominance of the microphanerophytes. The mesophanerophytes (19.25%) make of Kouoghap a forest grouping of high cluster, characteristic of the vallicole forests (Lebrun and Gilbert, 1954). This forest of valley is an edaphic grouping and also physiographic grouping. It benefits from a favorable microclimate due to the constriction of the sides of the valley of the Lionlong River. The conditions are therefore auspicious to the good growth of the trees, reaching 30m of height, with the cylindrical and straight stems; from where the height raised of the dome. The samplings shows some particular species of *Piptadenistro-Celtidetalia* (*Albizia adianthifolia, Albizia zygia, Lovoa trichilioides, Hylodendron gabunense* and *Funtumia elastica*), of the always green forest (*Amphimas pterocarpoides, Dacryodes macrophylla* and *Erythrophleum ivorense*) which are dominating species, descended of the Guinian various forestry types.

They become quickly familiar in the the northern zone, can be recovered in many places, especially in the gallerie forest. This floristic differentiation of the northern fringe of the semi - deciduous forest has already been described in Ghana, in coast of Ivory in

Nigeria (Chipp, 1927; Mangenot, 1955; Taylor, 1960; Aubréville, 1959). It shows also some particular species in this northern zone of the semi-deciduous forest for the arborescent stratum, non met more at the South or at least with a least extension. This closeness between some species which appear bound to the particular conditions offered by the valley offered a core of individualisable grouping that we erected in plant association: the *Synsepaletum cerasiferum* ass. nov.

The main dynamic role is played within the plantation formation by species of the ombrophile and sempervirent forest that constitutes the forest "postclimax", relative to the succession, described in this work. Some species are found indifferently in the low and middle altitude vegetations, submountaneous and mountaneous vegetations. These species are part of the sylvan woody vegetation in African tropical and subtropical regions, of the class of the *Strombosio-Parinarietea*. The characteristic species of that class in the Kouoghap forest: *Ficus thonningii, Strombosia pustulata, Dracaena fragrans, Strombosia grandifolia* and *Sapium ellipticum* permit us to affiliate the Kouoghap sacral forest to thatphytosociological class. The species as *Raphia farinifera, Xylopia rubescens, Cola verticillata, Ficus jansii, Draceana arborea* and *Gaertnea paniculata* are characteristic of the order of the *Garcinietalia* Noumi 1998. *Garcinia polyantha and Garcinia smeathmannii* are the features that permit to affiliate the forest cf sempervirent of Kouoghap to the alliance of the *Garcinion* Noumi 1998.

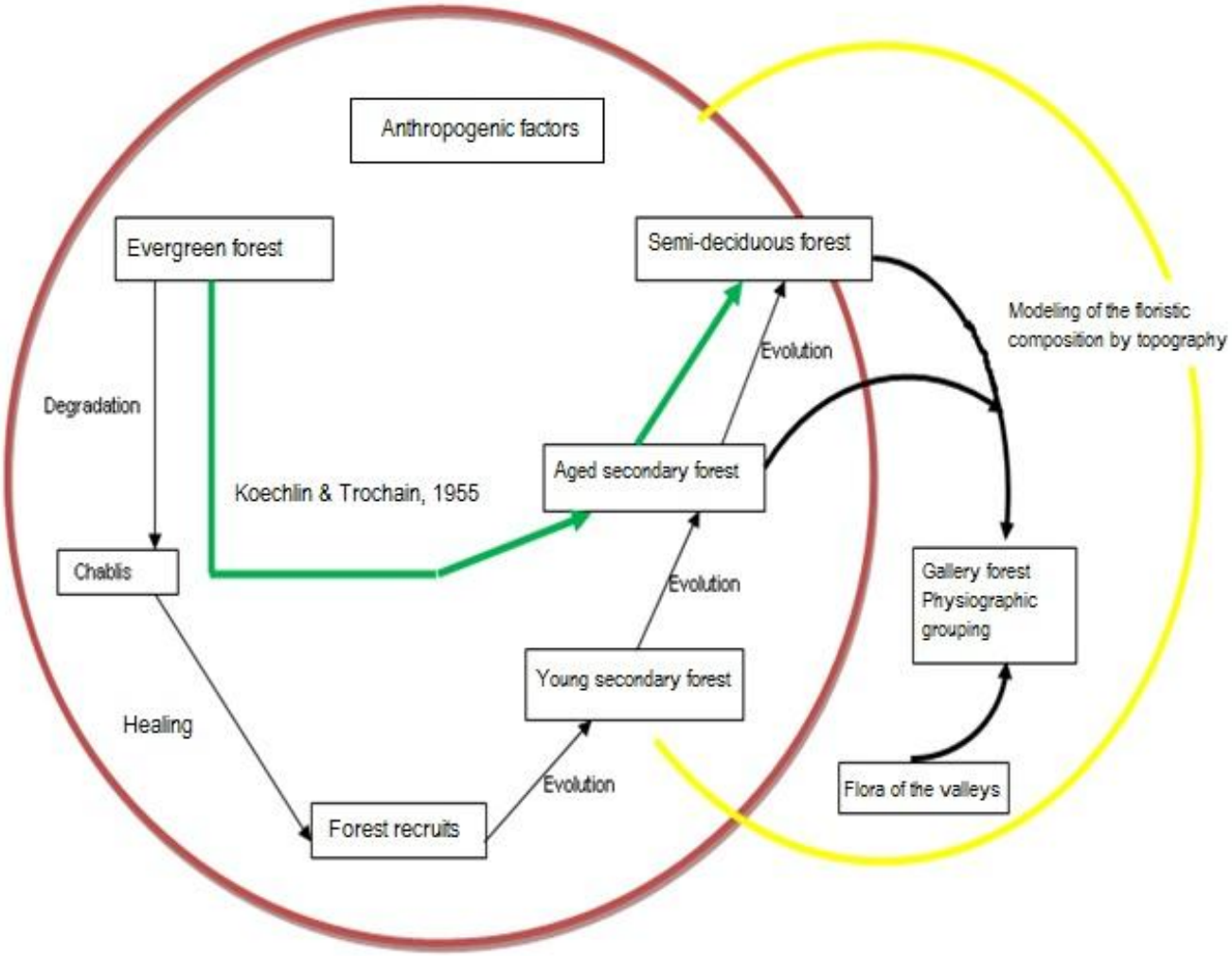

Fig. 7: Transformation of the rain forest demage to gallery forest.

Tricalysia macrophylla is mentioned like characteristic of the association *Tricalysietum macrophylla* of the *Garcinion*. The information collected on the land permit to spread the area of this vegetation type and to raise it to the rank of association. If one refers to the area of extension of *Tricalysia macrophylla* (Hallé, 1966), one can think that this association is afrotropical. In Cameroon, it is signalled in the locality of Eseka (Zenker, 1898), to the South of the Nyong stream and to 200 m of altitude of a primary forest of Songbong (Leeuwenberg, 1965). It has also been harvested in the locality of Kribi and Eseka (Leeuwenberg, 1965) therefore the samples are available to the National herbarium of Cameroon (YA). In Africa, the species is signalled in Ivory Coast, Togo, Nigeria (Hallé, 1966).

The Kouoghap gallery forest, surrounded with the concession of the Batoufam population, contains some sudano-zambezian elements (13.58% of the total of the species). This islet is a relic withfloristic composition shaped by the cf sempervirent relief forest of *Tricalysia macrophylla*. The elements of the latter are included currently in this regenerated forest: 16.6% of the total species belongs to the secondary forests and reaches a relative coverage of 26.80%), that evolves toward the semi-déciduous forest: 16.6% of the total of the species reaching a relative coverage of 8.86%), herself, shaped by the relief in gallery forest: 6.42% of the total of the species reaching a relative coverage of 13.48%). The studied formation is therefore a succession forest cf sempervirent - forest gallery. It is therefore a “postclimax' forester” of the gallery forest of the northern peripheral domain of the Guineo-Congolian region (Koechlin and Trochain, 1955; Letouzey, 1968). The totpographic localization of the old elements on the flank of the Kouoghap valley is an illutration of such a sequence given in Fig. 7.

Conclusion

The poll of the flora of the Kouoghap sacral forest permitted to have visions of the succession forest cf sempervirente - forest gallery, that evolved to give the present stage. The fundamental floristic core of the forest is constituted of the ombrophile species, before the stages of succession. This grouping has been described in an association; the *Tricalysietum macrophyllae* ass. nov. The phenomena of the succession gave the typical grouping of the gallery forest described also in an association: the *Synsepaletum cerasiferum* ass. nov. The two associations are overlapped thus in a succession that forms the nowadays Kouoghap sacral forest.

Conflict of interest statement

Authors declare that they have no conflict of interest.

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