

CHAPTER 4

METHODS

4.1 Introduction

One of the objectives of this study is to propose a revised methodology on analysing large vegetation data sets. The methodology is also directly in accordance with the primary goals of this study, which includes an attempt to classify the vegetation of the southern African Mopaneveld.

A step-by-step outlay of the procedures is presented as they were tested upon a large database, which includes all adequate vegetation data from the southern African Mopaneveld. The procedures for proposing the new method however involve many other facets of a vegetation study as well. Procedures for treating some of these facets are presented (4.2), followed by the actual procedures for vegetation analysis presented in a step-by-step approach (4.3).

In addition to the synthesis of the entire Mopaneveld, a further synthesis was undertaken on the South African Lowveld Mopaneveld due to special interest in the area and due to adequate vegetation data available from the area. The methods for the synthesis of the South African Lowveld Mopaneveld follow the same procedures as for the synthesis of the entire Mopaneveld. Only the differences in the approach are discussed in this chapter.

Please note that all names of taxa follow Arnold & De Wet (1993). A list of all taxa included in the TURBOVEG database is presented in Appendix 3.

4.2 Steps preceding computer-based procedures

4.2.1 Study area selection

As to propose a method for treating large vegetation data sets, not only was a study area selected according to the availability of phytosociological data, but also according to the contribution

such a study would make to vegetation knowledge of that area. The Mopaneveld of southern Africa was selected as the study area. The selection was motivated by the lack of comprehensive phytosociological knowledge of this extensive vegetation type in spite of relevé data available from several local studies (Chapter 2).

4.2.2 Literature surveying

This dissertation includes an extensive literature survey. Literature on Mopaneveld, including vegetation descriptions, management recommendations, taxonomy, ecology and plant uses were collected. The main function of the literature assessment was to become familiar with the field of study and to present a brief overview on the species *Colophospermum mopane* and on Mopaneveld vegetation over its entire distribution range (Literature Review presented in Chapter 2).

4.2.3 Vegetation data surveying

Applicable and suitable data sets on Mopaneveld vegetation are limited and not freely accessible. A search on vegetation data from studies conducted in any part of the Mopaneveld was undertaken for possible contribution to vegetation classification. Since the study is based on existing data of Mopaneveld vegetation, only a few field surveys were made to complement the existing data.

For existing vegetation data sets to be included in the computer database of Mopaneveld vegetation, the data had to conform to specific criteria as indicated below (4.2.3.1).

4.2.3.1 Criteria for vegetation data inclusion

Data could only be included for analysis if it conformed to the following criteria:

1. Vegetation data had to be sampled in Mopaneveld savanna.
2. Vegetation data had to consist of total floristic composition (therefore including a detailed survey of the woody- and herbaceous strata).

3. Published data with vegetation descriptions should preferably be used, although unpublished data from M.Sc.– or Ph.D studies were also included. Studies undertaken for the fulfilment of lower degrees were only used if the data set could contribute to a relatively undersampled- or an unknown area and after the data were assessed thoroughly for corrections and comprehensiveness.
4. Unpublished data from studies still in progress were included (with agreement with the recorders), especially where the study could contribute to an area where no other adequate vegetation data sets exist.

Adequate habitat data of each vegetation sample should have been a criterion but due to a general lack of habitat data in most of the conducted studies, this criterion could not be included. Suitable, compatible data from the Mopaneveld that conformed to the above criteria were obtained from 15 vegetation studies, listed in Table 2. These were the only compatible phytosociological data available at time of data acquisition.

4.3 Computer-based procedures

Step 1

Data sets that conformed to the above criteria were selected and consequently used to compile a database on Mopaneveld vegetation. The database was created in the computer program TURBOVEG (Hennekens 1996a) and is currently stored at the University of Pretoria, Botany Department, African Vegetation and Plant Diversity Research Centre.

Data were captured in the following ways, depending on the format in which data were accessible:

- imported from CEP-files stored in the University of Pretoria main frame database
- captured from field sheets
- captured from published tables
- directly retrieved from existing TURBOVEG files

Step 2

The complete Mopaneveld database (2 298 relevés stored in TURBOVEG) was exported as a Cornell Condensed species file (cc-file) to a working directory in MEGATAB (Hennekens 1996b). The option in TURBOVEG to distinguish between different vegetation layers a single species occupy, was made inapplicable by combining all layers into one (no layer).

4.3.1 Classification

Step 3

The cc-file was opened in MEGATAB. The option in MEGATAB to change the order of the table was applied using Two-Way-Indicator-Species-Analysis (TWINSpan) (Hill 1979b). In order to identify relevés representing azonal vegetation, TWINSpan was applied on a single division level (default cutlevels). After each separation of the table in two parts, the azonal relevés were exported as a cc-file and saved for further analysis in future. This procedure was repeated until the separation revealed two parts containing zonal vegetation in Mopaneveld. A total of 2 246 relevés remained as relevés probably representing zonal vegetation in Mopaneveld.

Step 4

Due to the inconsistency between authors considering species identification (especially lower than the species level), most subspecies and variations were combined into the relevant species name. This option was carried out in MEGATAB.

Step 5

TWINSpan classification was applied to the 2 246 zonal relevés on cutlevels 0-5-25-50 and on 6 levels of division. The rest of the parameters were left default. TWINSpan revealed the identification of 43 clusters.

Step 6

The 43 clusters contained various numbers of relevés. Clusters containing less than 5 relevés were omitted from the TWINSpan table for refinement purposes. During the identification of large vegetation units for the phytosociological synthesis, clusters containing small numbers of relevés were considered not being clearly representative of a large vegetation unit and were

therefore ignored for refinement. After refinement, those clusters were examined and if they contained valuable contributions to the table, they were moved into a suitable position in the table. A total of 29 clusters were considered for refinement.

Step 7

To facilitate the immense task of refining a phytosociological table containing more than 2 000 relevés and almost 1 500 species, a synoptic table was constructed directly from the TWINSPAN table as an option in MEGATAB.

4.3.2 Refinement procedures

Step 8

1. The order of the species in the synoptic table was changed according to the frequency values of species in each cluster. Species fidelity was not calculated statistically (e.g. Chytrý *et al.* in press). However, all species being more-or-less confined to the same cluster were selected and concurrently moved to the top. These species were then sorted on order of the highest frequency to lowest frequency. All clusters were separately examined for fidelity and frequency after which they were moved into positions where they would compliment diagnostic species groups in the TWINSPAN table.
2. Many species have a wider distribution range, not being confined to only one cluster (i.e. differential species). After diagnostic species groups were identified according to step 8, differential species groups were identified according to high frequency values being shared by different clusters. These species groups were moved into positions where they are most likely to represent relations between clusters (Table 3).

After refinement, the synoptic table was closed. Changes to the order of species in the synoptic table were directly saved to the TWINSPAN table (a very valuable option in MEGATAB). It would however be impractical to present the full table as explanation to the results. Results of the large data set were best expressed in the synoptic table. Although the synoptic table contained only 29 clusters, the number of species still resulted in a very long table (a total of 105 species groups in Table 3!).

Step 9

Vegetation types and major plant communities within the Mopaneveld were identified according to the synoptic table (Table 3) and relevant habitat information. A vegetation type is suggested to represent a superior plant community containing different major plant communities. Diagnostic species groups for a vegetation type were moved to the top position, followed by its lower-rank diagnostic species groups.

Step 10

The hierarchy of the TWINSpan classification was examined in MEGATAB. A dendrogram following TWINSpan classification was created to present probable explanation of the results (Figure 12).

Step 11

The synoptic table, containing 29 clusters and 1 465 species, were further reduced to 10 clusters and 329 species (Table 4). Each major vegetation unit (vegetation types and major plant communities) was reduced to a single cluster, in which the frequency of each species to the major plant community or vegetation type was summarised. Frequency values for the larger vegetation units were calculated as follow:

- Each species was treated separately
- Example: *Cyathula uncinulata* (Species group 1, Table 3)
- x = vegetation type/major plant community
 - x_1 would be the very first major plant community/vegetation type (i.e. Zimbabwean Mopaneveld, vegetation type 1, major plant community 1.1 (Table 3))
 - x_2 would be the second major plant community/vegetation type (i.e. Zimbabwean Mopaneveld, vegetation type 1, major plant community 1.2 (Table 3))
- r = number of relevés
 - r_a would be the total number of relevés in cluster a (Table 3)
 - $r_{(x1)}$ would be the total number of relevés in the first vegetation type/major plant community
 - e.g. $r_{(x1)}$ = total number of relevés in 1.1 (Table 3)
 - = $r_a+r_b+r_c+r_d$
 - = $11+17+30+13 = 71$
- y = % frequency of plant species

- y_1 = % frequency of plant species 1

y_{1a} would be the frequency of plant species 1 in cluster a

e.g. consider *Cyathula uncinulata* species 1

$$y_{1a} = 18$$

$$y_{1b} = 35 \text{ etc.}$$

- r_{a1} = number of relevés in which species 1 occur in cluster a

$$= y_{1a}/100 \times r_a$$

$$= 18/100 \times 11$$

$$= 1.98$$

~2 relevés

- $y_{1(x1)}$ = % frequency of species one (e.g. *Cyathula uncinulata*) in major plant community/vegetation type 1

$$y_{1(x1)} = r_{a1} + r_{b1} + r_{c1} + r_{d1} / r_{(x1)}$$

$$= 2+6+30+12 / 71$$

$$= 50/71 \times 100$$

$$= 70\% \text{ (Table 4)}$$

The above calculations reduced the synoptic table in terms of clusters representing major vegetation units, although the number of species in the table remained high. In order to decrease the number of species to present a short, yet valuable expression of the major vegetation units in the Mopaneveld of southern Africa, species were selected according to their fidelity to, and their frequency in the vegetation unit they occur in. Species of frequency lower than 10 % in a syncluster (e.g. *Hermstaedtia linearis* in Species group 3, Table 4) were not selected for the reduced table (Table 5) although it is 18 % frequent in cluster b in Table 3. This selection and elimination of species resulted in a 10 cluster synoptic table containing 329 species being representative of the major vegetation units in the Mopaneveld being studied (Table 5).

Step 12

This reduced synoptic table (Table 5) was used to describe the vegetation types and major plant communities within the study area. Diagnostic species for each vegetation type and major plant community were identified according to their fidelity. Species being diagnostic for two and more vegetation units were regarded indicators of similarity between vegetation units.

4.3.3 Ordination

Species composition may be a more informative indicator of environment than any set of measured environmental variables (Ter Braak 1995). Considering the importance of environmental conditions on the distribution of Mopaneveld vegetation types, the ordination algorithm DECORANA (Detrended Correspondence Analysis) (Hill 1979a) was applied to the floristic data to relate the distribution of the major types along environmental gradients. The ordination algorithm was applied to the synrelevés rather than to all 2 246 relevés, due to the enormous dimensions of the data set.

The synoptic table created in MEGATAB was exported as a Cornell Condensed Species File. DECORANA was then applied to the exported synrelevés. No transformation of the data was carried out and all parameters were set to defaults during the application of DECORANA to the 29 clusters (synrelevés). A scatter diagram was created to present DECORANA results (Figure 19). Habitat data for each cluster were traced from the published literature and accordingly environmental gradients were fitted to the diagram.

4.4 Synthesis of the South African Lowveld Mopaneveld

For the synthesis of the South African Lowveld Mopaneveld, results of the complete synthesis of the southern African Mopaneveld were needed. After the South African Lowveld Mopaneveld (SALM) was identified as the *Cissus cornifolia* - *Colophospermum mopane* major vegetation type, all relevés representing this vegetation type were exported as a cc-file to a separate working directory in MEGATAB. The data of the SALM were therefore presented in a raw data matrix prior to further analysis. All procedures for the synthesis of the SALM were undertaken in that directory. Since the SALM vegetation data comprises more than 1 000 relevés itself, it was thought useful to apply the same method for data analysis (4.3) as was proposed for the analysis of the data set containing data from 15 studies undertaken in the Mopaneveld.

TWINSPAN classification was applied to the 1 375 relevés, firstly on a single division level. Since the scale in this part of the study narrowed, it was necessary to identify and discard all relevés representing azonal vegetation. The Sandveld communities of the Punda Milia-Pafuri-

Wambiya (Van Rooyen 1981b) were thought to be clearly separated by this procedure. However, many relevés representing those communities remained within the scope of Mopaneveld vegetation. After a division within the Mopaneveld resulted, TWINSPAN was applied to the remaining relevés on default cutlevels and default levels of division. A synoptic table was constructed in order to identify the major plant communities within the SALM. The same procedures were followed as in *Step 11* to present a reduced synoptic table of the four major plant communities of the SALM (Table 6).

The procedures following the identification of the major plant communities in the SALM differ somewhat from the entire synthesis. Four major plant communities were identified and were further analysed separately to identify the plant communities within each. Each major plant community was therefore exported as a separate file for further analysis. TWINSPAN classification at default cutlevels and two levels of division were regarded the most effective procedure in which plant communities, which probably represent alliances, could be identified for each of the four major plant communities. Since the study did not aim to identify plant communities below the alliance level, only several relevés in “oversampled” areas (regarded oversampled only for the purpose of this study) were included in the final tables. The relevés to be included in the final tables were selected randomly within each cluster for the results to be easily presented in Braun-Blanquet tables (Tables 7 & 8).

Refinement procedures followed the Braun-Blanquet approach (Westhoff & Van der Maarel 1982), which were proved to be successful in several phytosociological studies (e.g. Behr & Bredenkamp 1988; Dekker & Van Rooyen 1995; Brown 1997; Eckhardt *et al.* 1996; Visser *et al.* 1996; Smit *et al.* 1997). The phytosociological tables contain total floristic composition of the major plant communities. Species abundance is presented at the Braun-Blanquet cover-abundance scale.

The discussion on two of the four major plant communities within the SALM is presented in Chapter 6. Although analysis and refinement of all four major plant communities have been completed, only two are included in this study because the description actually falls beyond the objectives of this study. The complete synthesis of the SALM will however be presented in subsequent papers.

Table 2 Data sets used for a phytosociological synthesis on Mopaneveld vegetation

	Author	Year	Location	No. of Relevés
1.	Beck, N.G.	1998	Foskor, mine, Phalaborwa, South Africa	114
2.	Dekker, B.	1995	Messina Experimental Farm, South Africa	148
3.	Du Plessis, F.	1998	Kruger National Park & North of the Soutpansberg, South Africa	19
4.	Du Plessis, F.	1998	Botswana Mopaneveld & Cuvelai Delta, Namibia	31
5.	Gertenbach, W.P.D.	1987	Southern distribution of Mopaneveld, Kruger National Park, South Africa	250
6.	Gertenbach, W.P.D.	1976	Mopaneveld north of the Olifants River in the Kruger National Park, South Africa	380
7.	Hinn, C.	2000	Save River Valley, Zimbabwe	230
8.	Kelly, L.	1996	Pylkop, Louis Trichardt, South Africa	62
9.	Le Roux, C.	1976	Etosha National Park, Namibia	204
10.	NOLIDEP	1998	Kaokoland, Namibia	34
11.	Purchase, A.	1997	Hoedspruit-Klaserie-Timbavati-Umbabat Nature Reserves, South Africa	374
12.	Ströhbach, B.	1998	Cuvelai Delta, Namibia	40
13.	Swart, H.B.	1998	Letaba Ranch, South Africa	200
14.	Van Rooyen, N.	1978	Punda Maria-Pafuri-Wambiya, Kruger National Park, South Africa	196
15.	Visser, N.	1996	Honnet Nature Reserve, Tshipise, South Africa	57

Table 3 Complete synoptic table of the Mopaneveld

Cluster	1				2				3				4			5			6			aa	bb	cc						
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u				v	w	x	y	z	
Number of relevés	11	17	30	13	13	44	64	10	44	48	257	471	405	49	193	8	132	17	31	18	19	51	93	109	18	20	37	14	10	
	1.1				1.2				2				4			5			6.1			6.2			7.1			7.2		
Species group 1																														
<i>Cyathula uncinolata</i>	18	35	100	92	15	66	47	20																						
<i>Digitaria milaniana</i>	91	35	23	62	23	86	88	10			0.4										2									
<i>Cucumis zeyheri</i>	9	71	57	8	23	50	23	10			0.4	0.2																		
<i>Abutilon grandiflorum</i>	9	24	47		31	5	5	50																						
<i>Cucumis metuliferus</i>		18	7		39	16	6	60			0.4																		7	
<i>Cucumis anguria</i>		18	7		39	16	6	60			0.4																		7	
<i>Cucumis zeyheri</i>	9	71	57	8	23	50	23	10			0.4	0.2																		
Species group 2																														
<i>Boscia mossambicensis</i>	46	12	13	23			17			2	1		0.2																	
<i>Cissus rotundifolia</i>	27	6	67	31		2	11				3																			
Species group 3																														
<i>Senecio species</i>	9	18	7			5	2																							
<i>Hemibistaedia linearis</i>		18	7			5	3															3					8			
<i>Echinochloa colona</i>		12									2																			
<i>Acacia nilotica subsp. kraussia</i>		12	3										0.2									3								
Species group 4																														
<i>Cyperus species</i>		6	63								1		0.5								2	1	11					7		
<i>Plectranthus caninus</i>			33		23			10			0.4																			
<i>Balanites maughamii</i>			10								2	2	1	0.2	8						7								7	
<i>Eragrostis heteromera</i>	9		10				5			5	2	5	2	3	6															
Species group 5																														
<i>Dactyloctenium australe</i>	9	18	13			2	2					0.6																		
<i>Dactyloctenium giganteum</i>	64	53	27			9	17			2	8	0.8	0.2		6															
Species group 6																														
<i>Plectranthus neochilus</i>			23	46			2				0.4																			
<i>Thilachium africanum</i>	18		43	15			9				4	0.2	0.2																	
<i>Zanthoxylum capense</i>			37	31			3				0.8		2		0.5															
<i>Maytemus procumbens</i>			3	15			2	3	10																					
Species group 7																														
<i>Boscia mossambicensis</i>	46	12	13	23			17			2	1		0.2																	
<i>Cissus rotundifolia</i>	27	6	67	31		2	11				3																			
Species group 8																														
<i>Milletia sutherlandii</i>				62			2																							
<i>Grewia caffra</i>				39	7	3																								
<i>Monodora junodii</i>				31	2	2					2	0.4		20																
<i>Artabotrys brachypetala</i>				23			10				2	0.4		10																
<i>Melinis nervigumis</i>			7	23	9																2	7					8	21		
<i>Strychnos potatorum</i>				23	7	2					0.8	0.2																		
<i>Combretum microphyllum</i>				23	2						1																			
<i>Vitex buchananii</i>				15																										
<i>Cyphostemma species</i>		6		15	2									0.5	8	6					2									
<i>Milletia grandis</i>				15			10				1																			
Species group 9																														
<i>Vigna frutescens</i>		6		62	30	3						0.2																		
<i>Phyllanthus reticulatus</i>			7	39	21	6				2	4	1	0.2	6																
<i>Tragia okayua</i>				15	14																									
<i>Justicia kirkiana</i>				8	23	2																	0.9							
<i>Ceratolthea sesamoides</i>				8	11																									
Species group 10																														
<i>Stylochiton natalensis</i>		6	23	39	23	9	2				5	4	2	2																
<i>Vernonia hundiensis</i>	9	12	3		46	7	2														1	6		5	27					
<i>Eragrostis cilianensis</i>		18	10		15	5							0.2									2								
<i>Enteropogon monostachyus</i>			47		46	9							0.2																	
<i>Crotalaria species</i>		6	23		23	23	2																							
<i>Setaria sphacelata</i>		12			15	64	2			4	1	0.4	2		1							6					5			
Species group 11																														
<i>Diospyros quiloensis</i>		12	50	62	15	48	31				0.4		0.2																	
<i>Indigofera varia</i>		77	63		31	32	13			4	0.4		0.7		0.5						3									
Species group 12																														
<i>Acacia schweinfurthii</i>					15	2					70		2	0.8																
<i>Grewia inaequilatera</i>		6			8	2					40			0.4																
<i>Capparis tomentosa</i>	9	6			8		3				30		10	5	1															
<i>Maerua edulis</i>			3				3				20			0.8		0.2														
<i>Panicum species</i>											10																			
<i>Cardamine africana</i>							2				10			0.4																
<i>Cordia monoica</i>		6			8	9	9				10		4	2	0.5							13	2							
<i>Kalanchoe lanceolata</i>			7				9				10		2	0.8	0.5	2														
<i>Abutilon hirtum</i>			3			5	2				10			0.4												0.9				
Species group 13																														
<i>Sporobolus fimbriatus</i>											82	48	9	9	7						6		83		2					
<i>Flaveria bidentis</i>											11	29																		
Species group 14																														
<i>Acacia burkei</i>							10				14	4	9	6	1							6								
<i>Hyparrhenia hirta</i>											11																			



Cluster	a	b	c	d	e	f	g	h	1	2	3	4	5	6	aa	bb	cc																																					
Number of relevés	11	17	30	13	13	44	64	10	44	48	257	471	405	49	193	8	132	17	31	18	19	51	93	109	18	20	37	14	10																									
	1.1				1.2				2		3				4		5				6.1		6.2		7.1		7.2																											
Species group 15																																																						
<i>Croton megalobotrys</i>						2						5	60	1					0.2																																			
<i>Ficus sycomorus</i>										2	38					0.8																																						
<i>Phragmites australis</i>										2	35																																											
<i>Hyphaene coriacea</i>											15	0.4	0.2	0.7						4																																		
<i>Phoenix reclinata</i>											15	2																																										
<i>Cynodon dactylon</i>										2	13	2	0.6						1												7																							
<i>Sporobolus consimilis</i>											10							0.2																																				
<i>Sesbania sesban</i>											10	0.4	1						2																																			
<i>Nuxia oppositifolia</i>											10																																											
Species group 16																																																						
<i>Limeum fenestratum</i>											14	24	4	2						86												6											5											
<i>Cissus cornifolia</i>											14	78	50	29						60																																		
<i>Cassia abbreviata</i>										5	25	5	12	6	12						24	2		6		6		5																										
<i>Dalbergia melanoxylon</i>	9				3					16	8			2	15	28	38	31						17																														
<i>Grewia hexamita</i>											13	15	2						4	29						13												5	8															
Species group 17																																																						
<i>Dactyloctenium aegyptium</i>	18				13					5						2	18	6	0.5	4		2																	9															
<i>Enteropogon macrostachys</i>											31			9	15	3		2						2	3				2																									
<i>Abutilon guineense</i>											8	15	2		4						2	0.8																																
<i>Urochloa panicoides</i>											7			2	13	4		0.2																																				
<i>Sida rhombifolia</i>											4	13	3						4																																			
<i>Orthosiphon suffrutescens</i>											4	13	9						6																																			
<i>Trianthema salsoloides</i>											11	1						0.2																																				
<i>Boerhavia diffusa</i>											2	12	9						4	0.5													20	2																				
<i>Achyrocline leptostachys</i>											10	0.6	0.5																																									
Species group 18																																																						
<i>Maytenus senegalensis</i>											17	15		2		0.5		2		4																	5	13		6												14		
Species group 19																																																						
<i>Spirostachys africana</i>											32	43		16		4		2		10		0.5				3		17		1		11																						
Species group 20																																																						
<i>Diospyros mespiliformis</i>										8			10	2		15		10		2		1						6																9										
Species group 21																																																						
<i>Ceratopogon triloba</i>											6					40	5																2																					
<i>Crabbea velutina</i>											6					30	5	8																																				
<i>Chamaesyce neopolycnemoides</i>											4	30		7		2				0.5																6																		
<i>Indigofera filipes</i>											0.8					26	1																																					
<i>Polygala sphenoptera</i>										2	4	23		7		4																																						
<i>Grewia subspathulata</i>											5					21	0.5																																					
<i>Hibiscus sidiiformis</i>											7	21		8		6																																						
<i>Melhanie didyma</i>											9	22		4		2																																						
<i>Aristida scabrivalvis</i>											7	21		0.7		3				2																	6	3																
<i>Leucas newfizeana</i>											7					20																																						
<i>Ornithogalum seineri</i>											4					18	5																																					
<i>Aristida stipitata s. gracilliflora</i>											0.4					16																																						
<i>Trichoneura grandigluma</i>											0.4	16		5		2																																						
<i>Crotalaria virgulata</i>											3	16		9		6		3				0.8																	7															
<i>Limeum viscosum</i>											7					14																7																						
<i>Coccinia rehmannii</i>											6	14		2		7																																						
<i>Crotalaria schinzii</i>											4	14		2		2																																						
<i>Triumfetta pentandra</i>										2	0.6						14																																					
<i>Rhinacanthus xerophilus</i>											2	8		13		0.5				2																																		
<i>Chlorophytum galpinii</i>											6					13																																						
<i>Tricliceras laceratum</i>											0.8					11																																						
<i>Justicia anagaloides</i>											8					11	1																																					
<i>Phyllanthus incurvus</i>											7	11		0.5																																								
<i>Indigofera lupatana</i>											8	12		4		4																																						
<i>Monsonia burkeana</i>											2					10	2																																					
<i>Monsonia angustifolia</i>											5					10	4																																					
<i>Fimbristylis complanata</i>											1					11	4		2																																			
<i>Stylosanthes fruticosa</i>											2					10	2		2																																			
<i>Sporobolus panicoides</i>											3	10		0.2		1				0.8																	3																	
<i>Chascanum hederaceum</i>											2					10	1																																					
Species group 22																																																						
<i>Acalypha indica</i>											8	25		41		7		8		0.8				3		5																												
<i>Asparagus setaceus</i>											25					39	7	6						6																1														
<i>Cyperus rupestris</i>											12	31		4		2				9																																		
<i>Endostemon tereticauli</i>											15	37		0.5		2																																						
<i>Talinum cafferum</i>											18	26		6																	3																							
<i>Melhanie prostrata</i>											10					25	4																																					
<i>Phyllanthus asperulatus</i>											14	22		0.2																																								
<i>Ehretia amoena</i>											14	11		3		0.5																			6																			
<i>Hibiscus pusillus</i>											2					10	11		8																																			
<i>Cucumis africanus</i>											6	16		17		6				2																	1																	
<i>Portulaca kermesina</i>	12				27						2					23	18		13																			2																
Species group 23																																																						
<i>Setaria incrasata</i>										2	6	3		0.6		19																																						
<i>Neorautanenia amboensis</i>															15																0.9											3												
<i>Sorghum versicolor</i>											5	2						1	0.4		12																			0.9														
<i>Hybanthus enneaspermus</i>											1	2		10																			4																					



Cluster	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	aa	bb	cc							
Number of relevés	11	17	30	13	13	44	64	10	44	48	257	471	405	49	193	8	132	17	31	18	19	51	93	109	18	20	37	14	10							
	1.1				1.2				2				3				4				5				6				7.1				7.2			
<i>Andropogon gayanus</i>											2	19	14	16																						
<i>Agathisanthemum bojeri</i>											2	14	5	18																						
<i>Combretum zeyheri</i>					8	2	2				2	12	3	47																						
Species group 31																																				
<i>Commelina erecta</i>										2	15	14	3	20											0.9		5	7								
<i>Tephrosia polystachya</i>											39	80	40	33							2															
<i>Waltheria indica</i>											20	64	5	20	1						2	2														
<i>Peltophorum africanum</i>									9		13	18	7	12	6							3					5		20							
<i>Indigofera rhytidocarpa</i>											19	29	8	10	0.5																					
<i>Aristida congesta s. congesta</i>									4		22	43	41	33	1	2								12												
<i>Indigofera vicioides</i>											15	36	23	12																						
<i>Solanum panduriforme</i>					11	3			13		43	34	26	12	0.5							26	1													
Species group 32																																				
<i>Hemizygia bracteosa</i>	18	35	37			11	8				0.4	9	2	10																						
<i>Melhania forbesii</i>		6	30		8	18	3		6		36	51	12	18	0.5						12			4		20	11	29								
<i>Aristida junciformis</i>		18	70		31	14	2						0.5	10								3	0.9													
Species group 33																																				
<i>Aristida rhinochloa</i>										2	0.2	1			37			3					9	22												
<i>Eragrostis curvula</i>			3								0.4	0.2	0.2		15							5														
<i>Sesamum alatum</i>											7	16			55																					
<i>Lannea discolor</i>												0.6	1		34																					
<i>Asparagus africanus</i>									2		0.4	2	0.5		30							4	2													
<i>Melolobium glandulifera</i>											0.4				30																					
<i>Aristida bipartita</i>												0.6			16																					
<i>Hyparrhenia anamesa</i>											0.4				12																					
<i>Microchloa caffra</i>										2	10	0.2			52								1													
Species group 34																																				
<i>Acalypha villicaulis</i>												0.7		0.5	63	63	65					20	1													
<i>Priva africana</i>												0.2			25	10	18																			
<i>Indigofera trita</i>															75	30	24							2	6					7						
<i>Ptychlobium contortum</i>															50	85	35																			
<i>Acrachne racemosa</i>														0.5	13	11	12																			
<i>Amaranthus schinzianus</i>															63	64	41																			
<i>Asparagus suaveolens</i>											0.8				25	33	35																			
<i>Calostephane divaricatata</i>									2		0.8	5	6		13	52	24	3							5				7							
<i>Tephrosia purpurea</i>											0.8	0.2			13	82	35						1	3				8								
<i>Commicarpus fallacissimus</i>											0.8	0.2	0.5		63	73	29								2											
Species group 35																																				
<i>Heliotropium strigosum</i>										4	17	4	8	0.5	13								2													
<i>Ximenesia caffra</i>									5		3	7	4	6	2	13						2														
<i>Justicia betonica</i>															13							2														
<i>Limeum aethiopicum</i>															25							4														
<i>Senecio harveianus</i>										0.4					13							4														
<i>Tribulus zeyheri</i>										0.4					13							2														
<i>Cardiospermum halicacabum</i>										2	0.8	0.5	2		13							2														
<i>Barleria senensis</i>										2	1	2			25	5	6									0.9										
Species group 36																																				
<i>Kohautia cynanchica</i>										0.4		0.2			39																					
<i>Indigofera nebromiana</i>															39																					
<i>Geigeria acaulis</i>															30							5	10		5											
<i>Pavonia columella</i>									2	2	0.8				21																					
<i>Boerhavia coccinea</i>									2						11	6	3																			
<i>Blepharis diversispina</i>															15	6														8						
<i>Barleria species</i>														0.5	14	6																				
<i>Limeum sulcatum</i>											2	4		2	33	6						1	3			10										
<i>Adansonia digitata</i>					8						0.8	0.2	0.2		17	6																				
<i>Sericorema remotiflora</i>											2	0.2	7		10	6						2														
Species group 37																																				
<i>Leucas sexdentata</i>												0.2		0.5	25	23																				
<i>Ocimum americanum</i>											16	9	4		25	32						20														
<i>Cleome angustifolia</i>											2	3	0.2	8	63	56						4														
Species group 38																																				
<i>Hernbstaedtia odorata</i>									2		18	20	4	4	0.5	63	21					26														
<i>Phyllanthus maderaspatensis</i>											13	25	25	2	30	6									14		5									
<i>Mariscus rehmannianus</i>											20	24	6		24	6																				
<i>Chamaecrista absus</i>											2	30	11	14	1	36								3			5									
Species group 39																																				
<i>Heliotropium steudneri</i>	24	3			5	2			2		31	46	25		33																					



Cluster	a	b	c	d	1	e	f	g	h	2	3	4	5	6	aa	bb	cc																													
Number of relevés	11	17	30	13	13	44	64	10	44	48	257	471	405	49	193	8	132	17	31	18	19	51	93	109	18	20	37	14	10																	
	1.1				1.2				2				3				4				5				6				7.1		7.2															
Species group 56																																														
<i>Anisotes rogersii</i>											2	0.4	2												10																					
<i>Triraphis ramosissima</i>																					25																									
<i>Acalypha glabrata</i>																					12																									
<i>Ipomoea cairica</i>																					20	0.9																								
<i>Indigofera melanadenia</i>																					10																									
<i>Indigofera daleoides</i>																					12	3	2											11												
<i>Sida cordifolia</i>											4	5	3	2	0.5				3				12	2											7											
<i>Abutilon angulatum</i>											6	0.8	0.5		0.5				13	41	8														14											
<i>Heliotropium ciliatum</i>	9	8														0.4	3				13	24	3				5																			
Species group 57																																														
<i>Eragrostis viscosa</i>																								23																						
<i>Wilkomkia sarmentosa</i>																								18		5																				
Species group 58																																														
<i>Enneapogon desvauxii</i>																								23		83	90											14								
<i>Eragrostis echinoclodea</i>																								4	18	94	65																			
<i>Eragrostis porosa</i>																								7	16	6	25																			
<i>Leucosphaera bainesii</i>																								53			94	80																		
<i>Monelytrum luederitzii</i>																								13			67	50																		
<i>Solanum species</i>	8														2	12			6	15	3																									
<i>Hibiscus caesius</i>																								26			17	15	3																	
<i>Indigofera charlieriana</i>																								2			10	33	45	5																
<i>Eragrostis nindensis</i>																								1	0.2	0.2											6	8	39			11	40	3		
Species group 59																																														
<i>Boscia foetida</i>											4	0.7				2	1	13	0.8											24	2	27	5				3									
<i>Helichrysum tomentosulum</i>																								20		3																				
<i>Commiphora glaucescens</i>																								7	10																					
<i>Lantana dinteri</i>																								14													7									
<i>Gossypium triphyllum</i>																								18																						
<i>Melinis longiseta</i>																								12													5									
<i>Aristida hordeacea</i>																								10																						
<i>Cyperus fulgens</i>																								1	14	3																				
<i>Vernonia cinerascens</i>																								12																						
<i>Seddera suffruticosa</i>											6	9	0.5											2	23	6	3																			
<i>Triaspis hypericoides</i>																								15																						
<i>Abutilon fruticosum</i>											5	0.6	1	0.5				0.8											1	26	6															
<i>Nidorella resedifolia</i>											0.8														13	6																				
<i>Aptosimum angustifolium</i>																								1	11	3																				
Species group 60																																														
<i>Acacia nilotica</i>											17	7	4	3	2														16	25	17											7				
Species group 61																																														
<i>Acacia senegal</i>											2	0.4	0.2	0.5														11	18	20				1	14	6	3									
Species group 62																																														
<i>Fingerhuthia africana</i>											5	4				8	20				6														32	24										
Species group 63																																														
<i>Dicoma tomentosa</i>											17				48	6	24				80				12											12	8	6	5	3						
Species group 64																																														
<i>Enneapogon scoparius</i>											82	19	6	20	6	0.5				0.8				18	89				100	4	7	14														
Species group 65																																														
<i>Heteropogon contortus</i>	8	23				6	9				11	33	60	4	1	0.8				12											1	30														
Species group 66																																														
<i>Combretum imberbe</i>	15				7				5	39				71	16	7	28	3				13	5	11				11	14				10													
Species group 67																																														
<i>Combretum apiculatum</i>	12				8				31	73				33	55				2	17	88	54	63	86	89				94	65	100	100	6	10	45											8
Species group 68																																														
<i>Monechma tonsum</i>																								3		11				5											7					
<i>Felicia clavipilosa</i>																								11																						
<i>Aizoanthemum dinteri</i>																								11		5																				
<i>Stipagrostis hochstetteriana</i>																								5	5	17																				
<i>Dipcadi species</i>																								2		11				5	5															
<i>Stipagrostis hirtigluma</i>											1											2	2	3	28																					
<i>Melhania damarana</i>																								1		5				17	5				3											
Species group 69																																														
<i>Stipagrostis hirtigluma s. pear</i>																								16		22																				
<i>Stipagrostis hirtigluma s. patul</i>																								2	19	11																				
<i>Psycholobium biflorum</i>																								11		17				5																
<i>Fockea angustifolia</i>											2	5	4	0.5											11	11	3																			
<i>Pegolettia senegalensi</i>											2	1	3	1											2	17	11	5				5														
<i>Monechma genistifolium</i>																								11		39				5	5															
Species group 70																																														
<i>Gisekia species</i>																								10																						
<i>Sporobolus acinifolius</i>																								6		15				7																
<i>Crotalaria damarensis</i>																								2	0.9				10																	
<i>Ipomoea sinensis</i>											0.8	2	1	2											4	15																				
<i>Trianthena triquetra</i>											0.8														20																					
<i>Senna italica</i>											2	4	1											4	15																					
<i>Sporobolus spicanus</i>																								2		10				3																
<i>Heliotropium species</i>											4	0.7														10																				
<i>Brachiaria malacodes</i>																								1		8				10																
<i>Heliotropium giessii</i>																								1		15																				



Cluster	a	b	c	d	1	e	f	g	h	2	i	j	k	l	3	m	n	o	4	p	q	r	5	s	t	u	v	w	6	x	y	z	aa	bb	cc		
Number of relevés	11	17	30	13	13	44	64	10	44	48	257	471	405	49	193	8	132	17	31	18	19	51	93	109	18	20	37	14	10	7.2							
	1.1				1.2				2				3				4				5				6.1				6.2								
<i>Indigofera flavicans</i>																																			3	21	
Species group 80																																					
<i>Grewia retinervis</i>																								8			19	6	38	79							
<i>Vigna species</i>			3			18																					11		32	43							
<i>Acacia reficiens</i>																									4		33	6	5	49	29						
<i>Ehretia rigida</i>											2	9	6	18									4			18			22	36							
<i>Helinus integrifolius</i>																											29	6	5	3	36						
<i>Acacia mellifera</i>																										1	17	6	5	32	43						
<i>Antheopora pubescens</i>																										4	44	11		70	21						
<i>Blepharis obmitrata</i>																											19		10	3	29						
<i>Heliotropium ovalifolium</i>											1	0.4														5	16	11	30	19	14						
Species group 81																																					
<i>Antheopora schinzii</i>																											20	30	11	15	21						
Species group 82																																					
<i>Aristida meridionalis</i>													6	2	2							5	41				4		10			70	36				
Species group 83																																					
<i>Monechma divaricatum</i>												3	3		4	0.5	63	10		3					53	1	26	33	30	14	21						
<i>Stipagrostis uniplumis</i>										2		2	0.4	1	8	3	38	64	18	71	6	5	39	15	54	61			78	79							
Species group 84																																					
<i>Boscia albitrunca</i>			3									3	5	5		27	0.5	25	74	29	7				22	22	40	6		60	64						
Species group 85																																					
<i>Commiphora pyracanthoides</i>												3				14	0.2					7				10			8	5	43	6		14	57		
Species group 86																																					
<i>Hibiscus micranthus</i>																53	74	36	18	0.5	50	72	53						16			3	36				
<i>Schmidia pappophoroides</i>																32	66	59	53	41		11	12	10			12	17	18	17		84	50				
<i>Brachiaria deflexa</i>										7	2				22	37	3	4	84	50	98	71	7	56			5	0.9		5		7					
Species group 87																																					
<i>Digitaria eriantha</i>												21	4	42	71	76	94	27		5	53	39	6	5	2	1							21				
<i>Terminalia prunioides</i>			3					3				39	13	14	27	10			22	75	90	18	10	17	32	61	33	55			14	50					
<i>Eragrostis lehmanniana</i>												48	25	13	8	0.7			7	38	61	18		89	5	71	1	7	17		81	64					
<i>Melinis repens</i>												32		4	52	17	6	39	13	50	59	52	67	5	8	10	62		10	41							
<i>Ozoroa paniculosa</i>												14			0.6	0.5	8	7				6	10	28	21		3	2			14	43					
Species group 88																																					
<i>Grewia species</i>												20		2	1											2					3	21					
Species group 89																																					
<i>Grewia flava</i>													15		2				0.4	0.6	0.2			38	82	59	13			7	24	6		38	79		
Species group 90																																					
<i>Albizia anthelmintica</i>	36	12				7	14	10				2	0.2	0.7													11	9			16	71					
Species group 91																																					
<i>Hyphaene petersiana</i>																											8							7		20	
<i>Harpagophytum zeyheri</i>														3													5									20	
<i>Regulenia pseudosphaerosper</i>																											2									40	
<i>Scilla nervosa</i>																											1									10	
<i>Salacia buebbertii</i>																																				10	
<i>Basanthie pedata</i>																																				10	
<i>Ophioglossum polyphyllum</i>																											1									10	
<i>Pentarrhinum insipidum</i>																												1								10	
<i>Tragus racemosus</i>																												10								20	
<i>Tavaresia barklyi</i>																												4								10	
<i>Stipagrostis uniplumis v. unipl</i>																												9								30	
<i>Dichapetalum rymosum</i>																																				20	
<i>Ozoroa schinzii</i>																													1							50	
<i>Cyperus margariaceus</i>																												1								20	
<i>Asparagus nelsii</i>																											10									60	
<i>Hermannia eenii</i>																																				10	
<i>Tephrosia dregeana</i>																											3	3		5	35					40	
<i>Talinum arnotii</i>																											4						3			40	
<i>Cleome rubella</i>																												4	2							20	
<i>Dicoma schinzii</i>																											4									60	
<i>Lantana angolensis</i>																																				10	
<i>Solanum delagoense</i>																													0.9							10	
<i>Acrotome inflata</i>																											4									10	
<i>Prydrax livida</i>													0.4	0.2													2									20	
Species group 92																																					
<i>Ochna pulchra</i>																																			14	30	
<i>Bauhinia petersiana</i>																																		5		57	20
<i>Aristida stipoides</i>																												23								21	40
<i>Combretum engleri</i>																																					



Cluster	a	b	c	d	1				2		3					4			5			6			aa	bb	cc										
Number of relevés	11	17	30	13	13	44	64	10	44	48	257	471	405	49	193	8	132	17	31	18	19	51	93	109	18	20	37	14	10								
			1.1				1.2		2				3			4			5			6.1		6.2			7.1		7.2								
Species group 96																																					
<i>Eragrostis trichophora</i>									2	7	1	0.7				72	12	77			4	65	16	11		5	7	90									
Species group 97																																					
<i>Aristida stipitata</i>										0.8	0.6				20		4		13			2	5					7	10								
Species group 98																																					
<i>Mundulea sericea</i>									2						10	8	12	0.5					5	14	17		8	14	80								
<i>Ximenia americana</i>			3						7						10	4	6	6	13	8	12		2	5	3			14	10								
<i>Bulbostylis hispidula</i>									5						19	0.5	16	40		45	12		15				5		10								
<i>Terminalia sericea</i>								2	2						23	7	57	0.5			10		7	2			43	57	100								
Species group 99																																					
<i>Gisekia africana</i>									2						15	13	0.7	2		63	64	53		4	17	0.9		5	3	7	20						
<i>Rhynchosia toita</i>															10	44	38	20	0.5	38	20	35		2	10			3		30							
<i>Tribulus terrestris</i>		6	3						2						16	9	1			63	69			24	9	9	11	30		20							
Species group 100																																					
<i>Aristida adscensionis</i>										50	15	27	51	4		1	38	84	71			28	100	24	11	75	72	70	11	14	10						
<i>Sclerocarya birrea</i>						5	3			34	13	12	51	29	16	22		39	53	13	50	32	4	3	3						10						
Species group 101																																					
<i>Eriopogon cenchroides</i>										14	2		48	13	42	64	40	12	68	100	98	88	81	39	84	69	24	72	61		27	43					
<i>Commiphora glandulosa</i>				7						21	2		2	9	7	12		23		0.8				6	14	2		5			20						
Species group 102																																					
<i>Commelina africana</i>										15	27	2			16	36	10	18	0.5	13				4	8	2					10						
<i>Ziziphus mucronata</i>										15	11	3	10	23	8	14	20	12	2	12		6		44	16	2	5	11			7	10					
Species group 103																																					
<i>Asparagus species</i>										30		8	9	2		2		0.5	2				3		2	5	25	11		62	50						
<i>Evolvulus alsinoides</i>										20			2	8			41	65	12	14	0.5		80	24		20	7	8		11		10					
<i>Grewia flavescens</i>		6								10	8	8	36	44	40		2	21	24	2	2	9				18	5		14		40						
<i>Kyphocarpa angustifolia</i>			6							13	39		9	9				48	78	6	6	35	50	84	41	3			3	7							
Species group 104																																					
<i>Colophospermum mopane</i>										35	100	100		21	27		80	33	28	43	85	8	93	88	98	41	55	83	100	35	84	80	6	5	60	7	80
<i>Grewia bicolor</i>										18	70	31		23	6			62	74	42	14	67	100	89	41			49	9	52	6	5	35	50	30		
<i>Commiphora africana</i>										12	7	15		5	5			14	35	26	2			11		29		6	7	6	11		19	57	10		
Species group 105																																					
<i>Dichrostachys cinerea</i>		18	29	20	39		32	25	80	27	17	37	64	51	33	52	13	60	18	45	50	84	8	25	55			68	79	10							
<i>Tragus berteronianus</i>		27	77	97	23		5	6			4	58	69	10	2	87	50	89	12	94			4	30	10	17	40		7	20							
<i>Panicum maximum</i>		27	12	27	39	69	82	63	90	23	48	83	86	67	86	5		14	65	36	17			8					50								
<i>Acacia tortilis</i>		73	35				2	33	70	2	17	25	7	9		5	13	22	6	13			22	3			25	3	7								
<i>Sida ovata</i>		27	35	7			7	13								0.4	0.2	2	1					24		2			3	57							



Table 4 Reduced synoptic table indicating species selected for final table (Table 5)

	Zimbabwe		Rivers	SA Lowv.	N.Soutp	Trans.	Nambia		Sand	
Major vegetation type	1.1	1.2	2	3	4	5	6.1	6.2	7.1	7
Number of relevés	71	131	92	1375	157	68	144	147	51	10
Species group 1										
<i>Cucumis metuliferus</i>	7	17							2	
<i>Cucumis zeyheri</i>	44	31								
<i>Abutilon grandiflorum</i>	27	11			1					
<i>Digitaria milanjiana</i>	44	75					1			
<i>Cyathula uncinulata</i>	70	48								
Species group 2										
<i>Boscia mossambicensis</i>	20	8	1							
<i>Cissus rotundifolia</i>	40	6		1						
Species group 3										
<i>Senecio species</i>	9	3								
<i>Hermbstaedtia linearis</i>	7	3						2	6	
<i>Echinochloa colona</i>	3									
<i>Acacia nilotica s. kraussiana</i>	4					1				
Species group 4										
<i>Cyperus species</i>	28						1	8	2	
<i>Plectranthus caninus</i>	14	3								
<i>Balanites maughamii</i>	4		1	1		3			2	
<i>Eragrostis heteromera</i>	6	2	3	3						
Species group 5										
<i>Dactyloctenium australe</i>	11	2								
<i>Dactyloctenium giganteum</i>	34	11	1	3						
Species group 6										
<i>Plectranthus neochilus</i>	18	1								
<i>Thilachium africanum</i>	24	4		1						
<i>Zanthoxylum capense</i>	21	1		1						
<i>Maytenus procumbens</i>	4	3								
Species group 7										
<i>Millettia sutherlandii</i>		7								
<i>Grewia caffra</i>		8								
<i>Monodora junodii</i>		5		1						
<i>Artabotrys brachypetala</i>		3		1						
<i>Melinis nerviglumis</i>	3	5					1	5	12	
<i>Strychnos potatorum</i>		6								
<i>Combretum microphyllum</i>		3								
<i>Vitex buchananii</i>		1								
<i>Cyphostemma species</i>	1	2			7		1			
<i>Millettia grandis</i>		2								
Species group 8										
<i>Justicia kirkiana</i>		9						1		
<i>Ceratotheca sesamoides</i>		4								
<i>Vigna frutescens</i>	1	18								
<i>Phyllanthus reticulatus</i>	3	14	1	1						
<i>Tragia okanyua</i>		6								
Species group 9										
<i>Stylochiton natalensis</i>	18	6		3						
<i>Vernonia lundensis</i>	6	8					1	5	20	
<i>Eragrostis cilianensis</i>	9	3					1	1		



	Zimbabwe		Rivers	SA Lowv.	N.Soutp	Trans.	Nambia		Sand	
Major vegetation type	1.1	1.2	2	3	4	5	6.1	6.2	7.1	7
Number of relevés	71	131	92	1375	157	68	144	147	51	10

<i>Enteropogon monostachys</i>	20	8								
<i>Crotalaria species</i>	11	11						4	4	
<i>Setaria sphacelata</i>	3	24	2	1	1					
Species group 10										
<i>Diospyros quiloensis</i>	35	43								
<i>Indigofera varia</i>	45	20	2			1	6	2	2	
Species group 11										
<i>Acacia schweinfurthii</i>		8	1							
<i>Grewia inaequilatera</i>	1	5								
<i>Capparis tomentosa</i>	3	5	5	1						
<i>Maerua edulis</i>	1	3								
<i>Panicum species</i>		1								
<i>Cardamine africana</i>		2								
<i>Cordia monoica</i>	1	9		2	2					
<i>Kalanchoe lanceolata</i>	3	5		1						
<i>Abutilon hirtum</i>	1	3						1		
Species group 12										
<i>Sporobolus fimbriatus</i>			64	7	1	22	1			
<i>Flaveria bidentis</i>			20							
Species group 13										
<i>Acacia burkei</i>		1	9	4		2				
<i>Hyparrhenia hirta</i>			5							
Species group 14										
<i>Croton megalobotrys</i>		1	34							
<i>Ficus sycomorus</i>			21							
<i>Phragmites australis</i>			19							
<i>Hyphaene coriacea</i>			5		3					
<i>Phoenix reclinata</i>			4							
<i>Cynodon dactylon</i>			8	1			5			10
<i>Sporobolus consimilis</i>			5							
<i>Sesbania sesban</i>			5	1						
<i>Nuxia oppositifolia</i>			5							
Species group 15										
<i>Limeum fenestratum</i>				24			2		4	
<i>Cissus cornifolia</i>				54						
<i>Cassia abbreviata</i>		1	15	11	2	3				
<i>Dalbergia melanoxylon</i>		9	1	27						
<i>Grewia hexamita</i>				12	1	1	3			
Species group 16										
<i>Dactyloctenium aegyptium</i>	10	2	1	6			6			
<i>Enteropogon macrostachys</i>	6	4		4	2	1		1		
<i>Abutilon guineense</i>			4	5	1					
<i>Urochloa panicoides</i>	3	1		4						
<i>Sida rhombifolia</i>			2	5						
<i>Orthosiphon suffrutescens</i>			2	7						
<i>Trianthema salsoloides</i>				2						
<i>Boerhavia diffusa</i>			1	7			7	1		
<i>Achyroopsis leptostachys</i>				2						
Species group 17										
<i>Maytenus senegalensis</i>			9	4			3	10	4	



	Zimbabwe		Rivers	SA Lowv.	N.Soutp	Trans.	Namibia		Sand	
Major vegetation type	1.1	1.2	2	3	4	5	6.1	6.2	7.1	7
Number of relevés	71	131	92	1375	157	68	144	147	51	10

Species group 18										
<i>Spirostachys africana</i>			40	5		6	1	8		
Species group 19										
<i>Diospyros mespiliformis</i>		2	9	4			6			
Species group 20										
<i>Ceratotheca triloba</i>				16			1			
<i>Crabbea velutina</i>				13						
<i>Chamaesyce neopolycnemoides</i>				13			2			
<i>Indigofera filipes</i>				9						
<i>Polygala sphenoptera</i>			1	11						
<i>Grewia subspathulata</i>				8						
<i>Hibiscus sidiformis</i>				11						
<i>Melhania didyma</i>				10						
<i>Aristida scabrivalvis</i>				9	2		4	2		
<i>Leucas neuflizeana</i>				8						
<i>Ornithogalum seineri</i>				8						
<i>Aristi stipitata s. graciliflora</i>				6						10
<i>Trichoneura grandigluma</i>				7						
<i>Crotalaria virgulata</i>				9	1			2		
<i>Limeum viscosum</i>				6			5			
<i>Coccinia rehmannii</i>				7						
<i>Crotalaria schinzii</i>				6						
<i>Triumfetta pentandra</i>			1	5						
<i>Rhinacanthus xerophilus</i>			1	6						
<i>Chlorophytum galpinii</i>				6						
<i>Tricliceras laceratum</i>				4						
<i>Justicia anagalloides</i>				6						
<i>Phyllanthus incurvus</i>				5						
<i>Indigofera lupatana</i>				7						
<i>Monsonia burkeana</i>				4						
<i>Monsonia angustifolia</i>				6						
<i>Fimbristylis complanata</i>				5						
<i>Stylosanthes fruticosa</i>				4						
<i>Sporobolus panicoides</i>				4	1			2		
<i>Chascanum hederaceum</i>				4						
Species group 21										
<i>Acalypha indica</i>			4	21	1			3		
<i>Asparagus setaceus</i>				20	1		1			
<i>Cyperus rupestris</i>				13						
<i>Endostemon tereticauli</i>				16						
<i>Talinum cafferum</i>				14			2			
<i>Melhania prostrata</i>				11						
<i>Phyllanthus asperulatus</i>				10						
<i>Ehretia amoena</i>				7			2			
<i>Hibiscus pusillus</i>			1	8						
<i>Cucumis africanus</i>			3	11			1			
<i>Portulaca kermesina</i>	14		1	10	1		1			
Species group 22										
<i>Setaria incrassata</i>			4	6						
<i>Neorautanenia amboensis</i>				4			1	2		
<i>Sorghum versicolor</i>		3		4			1			



Major vegetation type	Zimbabwe		Rivers	SA Lowv.	N.Soutp	Trans.	Nambia		Sand	
	1.1	1.2	2	3	4	5	6.1	6.2	7.1	7
Number of relevés	71	131	92	1375	157	68	144	147	51	10

<i>Hybanthus enneaspermus</i>				4	3					
<i>Tephrosia multijuga</i>			2	4				1		
<i>Pterocarpus rotundifolius</i>				5						
<i>Rhynchosia minima</i>			3	5				7	2	
Species group 23										
<i>Chamaecrista mimosoides</i>				19						
<i>Ipomoea crassipes</i>				14						
<i>Indigofera bainesii</i>				13					2	
<i>Bothriochloa insculpta</i>			2	16	2	1				
<i>Ozoroa engleri</i>				10						
<i>Kohautia virgata</i>				15						
<i>Brachiaria xantholeuca</i>			1	11						
Species group 24										
<i>Aristi congesta s. barbicollis</i>			1	43	50	1	1			
<i>Corchorus asplenifolius</i>				34				2		
<i>Acacia exuvialis</i>				25						
<i>Themeda triandra</i>			4	23						
<i>Ruellia patula</i>				24						
<i>Ormocarpum trichocarpum</i>			1	16						
<i>Sida dregei</i>			1	12			1			
<i>Bothriochloa radicans</i>			1	22				12		
<i>Blepharis integrifolia</i>				14				1		
<i>Lantana rugosa</i>	3	1		20			3			
<i>Tragia dioica</i>				16						
<i>Ipomoea obscura</i>			1	15				3	29	
<i>Phyllanthus pentandrus</i>				11				3	6	
<i>Maytenus heterophylla</i>		2		15		1		1		
Species group 25										
<i>Panicum coloratum</i>			11	17		1	13	3		
<i>Chloris virgata</i>			13	13	2		10	13		
Species group 26										
<i>Cymbopogon plurinodis</i>			20	18	1	32		1		
<i>Combretum hereroense</i>		4	45	21	1	5	5	8		
<i>Euclea divinorum</i>		1	23	18			2	6		
Species group 27										
<i>Eragrostis rigidior</i>	38	32	5	36		3	1		2	
<i>Justicia flava</i>	61	4	2	10	1		1			
<i>Sporobolus nitens</i>	52	8		10					2	
Species group 28										
<i>Vitex ferruginea</i>				1						
<i>Guibourtia conjugata</i>				2						
<i>Holarrhena pubescens</i>				1						
<i>Indigofera inhambanensis</i>				0						
<i>Xeroderris stuhlmannii</i>		2		0						
<i>Burkea africana</i>				1		9				20
<i>Cheilanthes viridis</i>				1						
<i>Hermannia glanduligera</i>			1	4	1					
<i>Zornia species</i>				3						
<i>Tephrosia longipes</i>				3			3			
<i>Pseudolachno maprounei</i>				2						
<i>Pellaea calomelanos</i>				1						



	Zimbabwe		Rivers	SA Lowv.	N.Soutp	Trans.	Nambia		Sand	
Major vegetation type	1.1	1.2	2	3	4	5	6.1	6.2	7.1	7
Number of relevés	71	131	92	1375	157	68	144	147	51	10

<i>Eragrostis pallens</i>			1	1					2	
<i>Chamaesyce tettensis</i>				2						
<i>Diplorhynchus condyloca</i>				1						
<i>Phyllanthus burchellii</i>				3	1					
<i>Bauhinia galpinii</i>				1						
<i>Pteleopsis myrtifolia</i>				1						
<i>Hymenocardia ulmoides</i>				1						
<i>Alchornea laxiflora</i>				1						
<i>Strychnos decussata</i>				1						
<i>Rhynchosia resinosa</i>				1						
<i>Celosia trigyna</i>				1						
<i>Vangueria infausta</i>			1	1	1		1		6	
<i>Hibiscus engleri</i>		5	2	4						
<i>Hexalobus monopetalus</i>			1	2	1					
<i>Corchorus kirkii</i>			3	1						
<i>Tragia rupestris</i>			2	1						
<i>Senna petersiana</i>			1	1						
<i>Tephrosia elongata</i>				1						
<i>Rhynchosia venulosa</i>				1						
<i>Aristida mollissima</i>				5						
<i>Spermacoce senensis</i>				2						
<i>Tarenna zygoon</i>				1						
<i>Striga asiatica</i>				1						
Species group 29				0						
<i>Vernonia fastigiata</i>				13						
<i>Clerodendrum ternatum</i>				27			1	7	16	
<i>Crotalaria sphaerocarpa</i>				10			1	1	2	
<i>Brachiaria nigropedata</i>				9	2				10	
<i>Merremia tridentata</i>				7				1	49	
<i>Strychnos madagascariensis</i>		3		9						
<i>Perotis patens</i>			1	10						
<i>Vigna unguiculata</i>				13						
<i>Andropogon gayanus</i>				12						
<i>Agathisanthemum bojeri</i>				7						
<i>Combretum zeyheri</i>		2		7						
Species group 30										
<i>Commelina erecta</i>			1	9				1	6	
<i>Tephrosia polystachya</i>				48			1			
<i>Waltheria indica</i>				28			2			
<i>Peltophorum africanum</i>			4	12			2		4	20
<i>Indigofera rhytidocarpa</i>				16						
<i>Aristida congesta s. congesta</i>			2	32	2		8			
<i>Indigofera vicioides</i>				22						
<i>Solanum panduriforme</i>		5	7	28			10			
Species group 31										
<i>Hemizygia bracteosa</i>	27	8		4						
<i>Melhania forbesii</i>	14	8	3	28			4	6	16	
<i>Aristida junciformis</i>	34	9					2	1		
Species group 32										
<i>Aristida rhinocloa</i>				6		1	6	16		
<i>Eragrostis curvula</i>				2		1				



	Zimbabwe		Rivers	SA Lowv.	N.Soutp	Trans.	Nambta		Sand	
Major vegetation type	1.1	1.2	2	3	4	5	6.1	6.2	7.1	7
Number of relevés	71	131	92	1375	157	68	144	147	51	10

<i>Sesamum alatum</i>				15						
<i>Lannea discolor</i>				5						
<i>Asparagus africanus</i>			1	5			3			
<i>Melolobium glandulifera</i>				4						
<i>Aristida bipartita</i>				2						
<i>Hyparrhenia anamesa</i>				2						
<i>Microchloa caffra</i>				11			1			
Species group 33										
<i>Acalypha villicaulis</i>					63		8			
<i>Priva africana</i>					12					
<i>Indigofera trita</i>					32			2	2	
<i>Ptycholibium contortum</i>					78					
<i>Acrachne racemosa</i>					11					
<i>Amaranthus schinzianus</i>					61					
<i>Asparagus suaveolens</i>					33					
<i>Calostephane divaricata</i>			1	4	47	1		4	2	
<i>Tephrosia purpurea</i>					73		1	2	6	
<i>Commicarpus fallacissimus</i>					68			1		
Species group 34										
<i>Heliotropium strigosum</i>				8	1		1			
<i>Ximenia caffra</i>			2	5	1		1			
<i>Justicia betonica</i>					1		1			
<i>Limeum aethiopicum</i>					1		1			
<i>Senecio harveianus</i>					1		1			
<i>Tribulus zeyheri</i>					1		1			
<i>Cardiospermum halicacabum</i>				1	1		1			
<i>Barleria senensis</i>				1	6			1		
Species group 35										
<i>Kohautia cynanchica</i>					33					
<i>Indigofera nebrowiana</i>					33					
<i>Geigeria acaulis</i>					25		3	8		
<i>Pavonia columella</i>			1	1	18					
<i>Boerhavia coccinea</i>			1		10	1				
<i>Blepharis diversispina</i>					13				6	
<i>Barleria species</i>	4	2			12					
<i>Limeum sulcatum</i>				2	28		1	4		
<i>Adansonia digitata</i>	1				15					
<i>Sericorema remotiflora</i>				3	9		1			
Species group 36										
<i>Leucas sexdentata</i>					21					
<i>Ocimum americanum</i>				7	28		7			
<i>Cleome angustifolia</i>				3	51		1			
Species group 37										
<i>Hermstaedia odorata</i>			1	12	21		9			
<i>Phyllanthus maderaspatensis</i>				19	26			10	4	
<i>Mariscus rehmannianus</i>				14	21					
<i>Chamaecrista absus</i>				13	30			2	4	
Species group 38										
<i>Heliotropium steudneri</i>	7	3	1	29	28		1			
<i>Digitaria velutina</i>	1	7			15	1	1			



	Zimbabwe		Rivers	SA Lowv.	N.Soutp	Trans.	Nambia		Sand	
Major vegetation type	1.1	1.2	2	3	4	5	6.1	6.2	7.1	7
Number of relevés	71	131	92	1375	157	68	144	147	51	10

Species group 39										
<i>Eleusine coracana</i>					2					
<i>Steganotaenia araliacea</i>			1		2			1		
<i>Berchemia discolor</i>		1	2	1	2		2	4		
<i>Ficus tettensis</i>		1			4					
<i>Dombeya roundifolia</i>			3	1	2			1		
<i>Albizia brevifolia</i>					2	3	1			
<i>Commiphora merkeri</i>					6		2			
<i>Xanthocercis zambesiaca</i>			7		1					
<i>Danthoniopsis dinteri</i>					8		1	1		
<i>Bridelia mollis</i>				1	1					
<i>Bidens pilosa</i>			1	3	8					
<i>Rhoicissus revoulii</i>		2		1	5					
<i>Markhamia zanzibarica</i>		4		1	7					
Species group 40										
<i>Jatropha spicata</i>					27					
<i>Megalochlamys kenyensis</i>					13					
<i>Eragrostis biflora</i>					16			1		
<i>Lantana species</i>					13			1		
<i>Sesamum triphyllum</i>		1			22		2	1		
<i>Commiphora tenuipetiolata</i>					23					
<i>Acacia erubescens</i>	1	7		2	15		1			
<i>Sterculia rogersii</i>		1		2	21					
<i>Justicia protracta</i>				4	25					
<i>Gardenia resiniflua</i>		10		1	18		1			
<i>Monechma debile</i>				5	13				4	
Species group 41										
<i>Indigofera heterotricha</i>				6	44					
<i>Neuracanthus africanus</i>			1	5	14					
Species group 42										
<i>Ipomoea magnusiana</i>				13	54				2	
Species group 43										
<i>Seddera capensis</i>				22	65					
<i>Grewia villosa</i>	3	1		9	26		3	16		
<i>Hermannia boraginiflora</i>				23	59		1			
<i>Corbichonia decumbens</i>				10	22					
<i>Phyllanthus species</i>			1	16	55					
<i>Pupalia lappacea</i>			3	15	14		1	7	2	
<i>Solanum coccineum</i>			1	9	25		1			
<i>Flueggea virosa</i>		2	2	20	7		2	9		
<i>Abutilon austro-africanum</i>			4	19	12					
<i>Pavonia burchellii</i>				16	30		6	4	2	
<i>Leucas glabrata</i>			2	19	33					
Species group 44										
<i>Achyranthes aspera</i>			5	7	63	1	8	5	6	
Species group 45										
<i>Commiphora mollis</i>		8	2	12	58	2	4	3		
<i>Tricholaena monachne</i>		8	1	25	8	3	1	2		
Species group 46										
<i>Lansea schweinfurthii</i>	3	13	3	22	30	6				
<i>Commelina benghalensis</i>	48	39	3	26	43		1	3	4	



	Zimbabwe		Rivers	SA Lowv.	N.Soutp	Trans.	Nambia		Sand	
Major vegetation type	1.1	1.2	2	3	4	5	6.1	6.2	7.1	7
Number of relevés	71	131	92	1375	157	68	144	147	51	10

<i>Combretum mossambicense</i>		5	3	13	11		7	1		
<i>Setaria sagittifolia</i>	3	18	4	1	12					
<i>Kirkia acuminata</i>		10		2	40	1	1	4		
<i>Commiphora edulis</i>		9			21					
Species group 48										
<i>Oropetium capense</i>	52	1		11	33			13		
Species group 49										
<i>Lonchocarpus capassa</i>	3	8	70	17	4	3				
<i>Kyllinga alba</i>	37	3		9	27		3	1	6	
<i>Rhigozum zambesiicum</i>	9			1	21					
Species group 50										
<i>Urochloa mosambicensis</i>	66	67	15	54	2				2	
<i>Grewia monticola</i>	30	45		11	32		2			
<i>Maerua parvifolia</i>	37	17	2	26	25					
Species group 51										
<i>Dicoma anomala</i>						13	5			
<i>Leonotis ocymifolia</i>			1			6	5			
<i>Coelachyrum yemenicum</i>						5	1			
<i>Thesium utile</i>						13	3		2	
<i>Indigofera comosa</i>						7	2			
Species group 52										
<i>Euphorbia cooperi</i>			2			5				
<i>Panicum deustum</i>			20	2		6				
<i>Xerophyta retinervis</i>			9	6		9				
<i>Digitaria argyrograpta</i>			7		1	7				
<i>Berchemia zeyheri</i>	1	1	8		3	7				
<i>Sporobolus pyramidalis</i>			5			5				
<i>Trachypogon spicatus</i>			5			7				
<i>Cymbopogon excavatus</i>			6	1		4		1		
Species group 53										
<i>Pogonarthria squarrosa</i>	1	3	9	33		21	5	1		
<i>Sansevieria hyacinthoides</i>			17	5	2	29				
<i>Eragrostis chloromelas</i>			9		1	12				
<i>Panicum natalense</i>			8			29				
<i>Eragrostis superba</i>	1	6	15	26		25	1	4	2	
<i>Aristida congesta</i>			10	11	80	77	11	1		
<i>Acacia gerrardii</i>	1	2	27	8	1	44			2	
<i>Albizia harveyi</i>		3	18	23	2	5				
Species group 54										
<i>Acacia nigrescens</i>		17	45	41	30	53	1			
Species group 55										
<i>Anisotes rogersii</i>				1			4			
<i>Triraphis ramisissima</i>							9			
<i>Acalypha glabrata</i>							4			
<i>Ipomoea cairica</i>							7	1		
<i>Indigofera melanadenia</i>							4			
<i>Indigofera daleoides</i>							6	1	8	
<i>Sida cordifolia</i>			2	3		1	6		2	
<i>Abutilon angulatum</i>			3		1		15	6	4	
<i>Heliotropium ciliatum</i>	3				1		9	3		



	Zimbabwe		Rivers	SA Lowv.	N.Soutp	Trans.	Nambia		Sand	
Major vegetation type	1.1	1.2	2	3	4	5	6.1	6.2	7.1	7
Number of relevés	71	131	92	1375	157	68	144	147	51	10

Species group 56										
<i>Eragrostis viscosa</i>							15			
<i>Willkommia sarmentosa</i>							12	1		
Species group 57										
<i>Enneapogon desvauxii</i>								39	4	
<i>Eragrostis echinochloidea</i>							3	34		
<i>Eragrostis porosa</i>							5	16		
<i>Leucosphaera bainesii</i>								62		
<i>Monelytrum luederitzia</i>								25		
<i>Solanum species</i>		1	1					12	2	
<i>Hibiscus caesius</i>								23	2	
<i>Indigofera charlierian</i>					1		1	18	4	
<i>Eragrostis nindensis</i>							7	36	2	
Species group 58										
<i>Boscia foetida</i>			2		1		10	21	2	
<i>Helichrysum tomentosulum</i>								15	2	
<i>Commiphora glaucescens</i>							5	7		
<i>Lantana dinteri</i>								10	2	
<i>Gossypium triphyllum</i>								13		
<i>Melinis longiseta</i>								9	4	
<i>Aristida hordeacea</i>								7		
<i>Cyperus fulgens</i>							1	10	2	
<i>Vernonia cinerascens</i>								9		
<i>Seddera suffruticosa</i>				4			1	18	2	
<i>Triaspis hypericoides</i>								11		
<i>Abutilon fruticosum</i>				2	1		1	20		
<i>Nidorella resedifolia</i>								10		
<i>Aptosimum angustifolium</i>							1	8	2	
Species group 59										
<i>Acacia nilotica</i>			9	4			22	13	2	
Species group 60										
<i>Acacia senegal</i>				1	11		8	11	2	
Species group 61										
<i>Fingerhuthia africana</i>			2	10		9		18		
Species group 62										
<i>Dicoma tomentosa</i>				25	69		8	7	2	
Species group 63										
<i>Enneapogon scoparius</i>			49	10	3	32	6	10		
Species group 64										
<i>Heteropogon contortus</i>		11	4	31	2		1	22		
Species group 65										
<i>Combretum imberbe</i>	3	5	56	14	5	6	9	7		
Species group 66										
<i>Combretum apiculatum</i>	4	44	27	64	83	84	9	33	6	
Species group 67										
<i>Monechma tonsum</i>								4	2	
<i>Felicia clavipilosa</i>								1		
<i>Aizoanthemum dinteri</i>								2		
<i>Stipagrostis hochstetteriana</i>							3	6		
<i>Dipcadi species</i>								4	4	
<i>Stipagrostis hirtigluma</i>							2	6		



	Zimbabwe		Rivers	SA Lowv.	N.Soutp	Trans.	Nambia		Sand	
Major vegetation type	1.1	1.2	2	3	4	5	6.1	6.2	7.1	7
Number of relevés	71	131	92	1375	157	68	144	147	51	10

<i>Melhania damarana</i>							1	6	2	
Species group 68										
<i>Stipag hirtigluma s. pearsonii</i>								13		
<i>Stipag hirtigluma s. patula</i>							1	13		
<i>Ptycholobium biflorum</i>								11		
<i>Fockea angustifolia</i>			1	2				10	2	
<i>Pegoletia senegalensis</i>			1	2			1	13	4	
<i>Monechma genistifolium</i>								14	4	
Species group 69										
<i>Gisekia species</i>								1		
<i>Sporobolus acinifolius</i>								3	2	
<i>Crotalaria damarensis</i>							1	2		
<i>Ipomoea sinensis</i>				1				5		
<i>Trianthema triquetra</i>								3		
<i>Senna italica</i>				2			3	2		
<i>Sporobolus spicatus</i>								3	2	
<i>Heliotropium species</i>			2					1		
<i>Brachiaria malacodes</i>							1	7		
<i>Heliotropium giessii</i>							1	2		
<i>Sporobolus salsus</i>								1		
<i>Panicum novemnerve</i>								4	2	
<i>Panicum lanipes</i>							1	2		
<i>Salsola tuberculata</i>								2		
<i>Eragrostis sabinae</i>								2		
<i>Kohautia azurea</i>								9		
<i>Blepharis leendertziae</i>								8		
<i>Lycium bosciifolium</i>								3		
<i>Erucastrum arabicum</i>								2		
<i>Acalypha segetalis</i>			1					11		
<i>Setaria verticillata</i>			1		6	1	4	10		
Species group 70										
<i>Chamaesyce inaequilatera</i>							3	17	2	
<i>Geigeria odontoptera</i>								10		
<i>Aizoon virgatum</i>								11		
<i>Ruellioopsis setosa</i>								13		
<i>Eragrostis annulata</i>							2	13		
<i>Eragrostis glandulosipedata</i>								11		
<i>Acacia nebrownii</i>								12		
<i>Heliotropium lineare</i>							1	8	2	
<i>Odyssea paucinervis</i>							5	11	2	10
<i>Hirpicium gazanioides</i>							1	12	2	
Species group 71										
<i>Triraphis purpurea</i>						1	17	14		
Species group 72										
<i>Aptosimum lineare</i>				14	75			22		
<i>Melhania rehmannii</i>			1	10	70			12	6	
Species group 73										
<i>Cyathula lanceolata</i>			2	2			3	12		
<i>Geigeria ornativa</i>				3			12	18	2	
Species group 74										
<i>Cenchrus ciliaris</i>		1	28	11	11	24	6	30		



	Zimbabwe		Rivers	SA Lowv.	N.Soutp	Trans.	Nambía		Sand	
Major vegetation type	1.1	1.2	2	3	4	5	6.1	6.2	7.1	7
Number of relevés	71	131	92	1375	157	68	144	147	51	10

Species group 79										
<i>Grewia retinervis</i>							3	15	49	
<i>Vigna species</i>	1							8	35	
<i>Acacia reficiens</i>							3	26	44	
<i>Ehretia rigida</i>			1	9			1	13	26	
<i>Helinus integrifolius</i>								23	12	
<i>Acacia mellifera</i>							1	14	35	
<i>Anthepphora pubescens</i>							3	34	57	
<i>Blepharis obmitrata</i>								15	10	
<i>Heliotropium ovalifolium</i>							3	17	18	
Species group 80										
<i>Anthepphora schinzii</i>							13	26	6	
Species group 81										
<i>Aristida meridionalis</i>				3	9		1	7	61	
Species group 82										
<i>Monechma divaricatum</i>				2	12	1	19	27	16	
<i>Stipagrostis uniplumis</i>			1	2	58	35	24	48	78	
Species group 83										
<i>Boscia albitrunca</i>	1			5	67	3	22	30	61	
Species group 84										
<i>Commiphora pyracanthoides</i>				5	6	5	6	33	26	
Species group 85										
<i>Hibiscus micranthus</i>				47	69			12	12	
<i>Schmidia pappophoroides</i>				54	11	5	15	15	75	
<i>Brachiaria deflexa</i>			4	30	93	18	3	1	2	
Species group 86										
<i>Digitaria eriantha</i>				12	62	10	21	1	6	
<i>Terminalia prunioides</i>	1			25	18	81	18	43	41	24
<i>Eragrostis lehmanniana</i>				36	6	55	25	26	7	76
<i>Melinis repens</i>				15	29	49	43	9	47	30
<i>Ozoroa paniculosa</i>				7	2	1	18	2	1	22
Species group 87										
<i>Grewia species</i>			1				1		8	
Species group 88										
<i>Grewia flava</i>	3				77	6	5	19	49	
Species group 89										
<i>Albizia anthelmintica</i>	8			1			7	7	31	
Species group 90										
<i>Hyphaene petersiana</i>							5		2	20
<i>Harpagophytum zeyheri</i>				1			3			20
<i>Requienia pseudosphaerma</i>							1			40
<i>Scilla nervosa</i>							1			10
<i>Salacia luebbertii</i>										10
<i>Basananthe pedata</i>										10
<i>Ophioglossum polyphyllum</i>							1			10
<i>Pentarrhinum insipidum</i>							1			10
<i>Tragus racemosus</i>							6			20
<i>Tavaresia barklyi</i>							3			10
<i>Stipag uniplumis var. uniplumis</i>							6			30
<i>Dichapetalum cymosum</i>										20
<i>Ozoroa schinzii</i>							1			50



	Zimbabwe		Rivers	SA Lowv.	N.Soutp	Trans.	Nambia		Sand	
Major vegetation type	1.1	1.2	2	3	4	5	6.1	6.2	7.1	7
Number of relevés	71	131	92	1375	157	68	144	147	51	10

<i>Cyperus margaritaceus</i>							1			20
<i>Asparagus nelsii</i>							6			60
<i>Hermannia eentii</i>										10
<i>Tephrosia dregeana</i>							2	3	25	40
<i>Talinum arnotii</i>							3		2	40
<i>Cleome rubella</i>							3	1		20
<i>Dicoma schinzii</i>							3		4	60
<i>Lantana angolensis</i>							0	1		10
<i>Solanum delagoense</i>							0	3		10
<i>Acrotome inflata</i>							3		2	20
<i>Psyrax livida</i>							1			20
Species group 91										
<i>Ochna pulchra</i>							0		4	30
<i>Bauhinia petersiana</i>							0		19	20
<i>Aristida stipoides</i>							15		6	40
<i>Combretum engleri</i>									8	10
<i>Combretum collinum</i>				6			1		10	60
Species group 92										
<i>Rhus tenuinervis</i>							3	1	20	50
Species group 93										
<i>Rhigozum brevispinosum</i>							4	19	73	10
<i>Urochloa brachyura</i>				4			6	23	10	10
Species group 94										
<i>Croton gratissimus</i>				1	2		9	22	47	70
<i>Pechuel-Loeshea leubnitziae</i>							17	9	4	30
<i>Schmidia kalihariensis</i>							13	13	29	60
<i>Acacia erioloba</i>						1	6	1	51	30
<i>Pogonarthria fleckii</i>							14	19	18	10
Species group 95										
<i>Eragrostis trichophora</i>			1	2	62	15	43	13	6	90
Species group 96										
<i>Aristida stipitata</i>				1	3	6	4		2	10
Species group 97										
<i>Mundulea sericea</i>				7			3	12	10	80
<i>Ximenia americana</i>	1			7	9		4	2	4	10
<i>Bulbostylis hispidula</i>				14	39		10		4	10
<i>Terminalia sericea</i>			1	12		5	5	1	47	100
Species group 98										
<i>Gisekia africana</i>			1	8	63		12	1	4	20
<i>Rhynchosia totta</i>				29	23		1	7	2	30
<i>Tribulus terrestris</i>			1	6	61		14	12		20
Species group 99										
<i>Aristida adscensionis</i>			32	24	80	35	16	74	12	10
<i>Sclerocarya birrea</i>		3	23	32	39	28	3	2		10
Species group 100										
<i>Enneapogon cenchroides</i>		6	30	52	97	71	40	61	31	
<i>Commiphora glandulosa</i>		8	1	11	1	0	11	2		20



	Zimbabwe		Rivers	SA Lowv.	N.Soutp	Trans.	Nambia		Sand	
Major vegetation type	1.1	1.2	2	3	4	5	6.1	6.2	7.1	7
Number of relevés	71	131	92	1375	157	68	144	147	51	10

Species group 101										
<i>Commelina africana</i>		12		19	1		7	1		10
<i>Ziziphus mucronata</i>		7	15	15	1	16	4	8	2	10
Species group 102										
<i>Asparagus species</i>	13	5	1			1	4	20	59	
<i>Evolvulus alsinoides</i>	8	5		34	70		12	6	8	10
<i>Grewia flavescens</i>	7	37	1	14		30	12	4	10	40
<i>Kyphocarpa angustifolia</i>	14	7		43	78	1	9		4	
Species group 103										
<i>Colophospermum mopane</i>	69	20	55	58	91	73	67	61	45	80
<i>Grewia bicolor</i>	40	11		59	84		23	40	39	30
<i>Commiphora africana</i>	9	4		22	9	13	7	6	29	10
Species group 104										
<i>Acacia tortilis</i>	20	22	10	10	20	6	10	3	4	
<i>Panicum maximum</i>	26	72	36	68	19	21	5		14	
<i>Tragus berteronianus</i>	68	5	2	50	79	43	21	15	2	20
<i>Dichrostachys cinerea</i>	25	29	22	52	53	57	19	41	71	10
<i>Sida ovata</i>	16	9					9	1	18	