

Leguminoschoria of southern Africa

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Aim :

Group **1655 indigenous legume spp.** in geographical regions and identify key species

Study Area :

South Africa, Lesotho, Swaziland

To obtain meaningful distribution patterns
from **27 322** PRECIS records

Cluster analyses was performed (A/P data)
XLSTAT 2010.6.01

PRECIS: QDGC=675 km² (26 x 26 km)

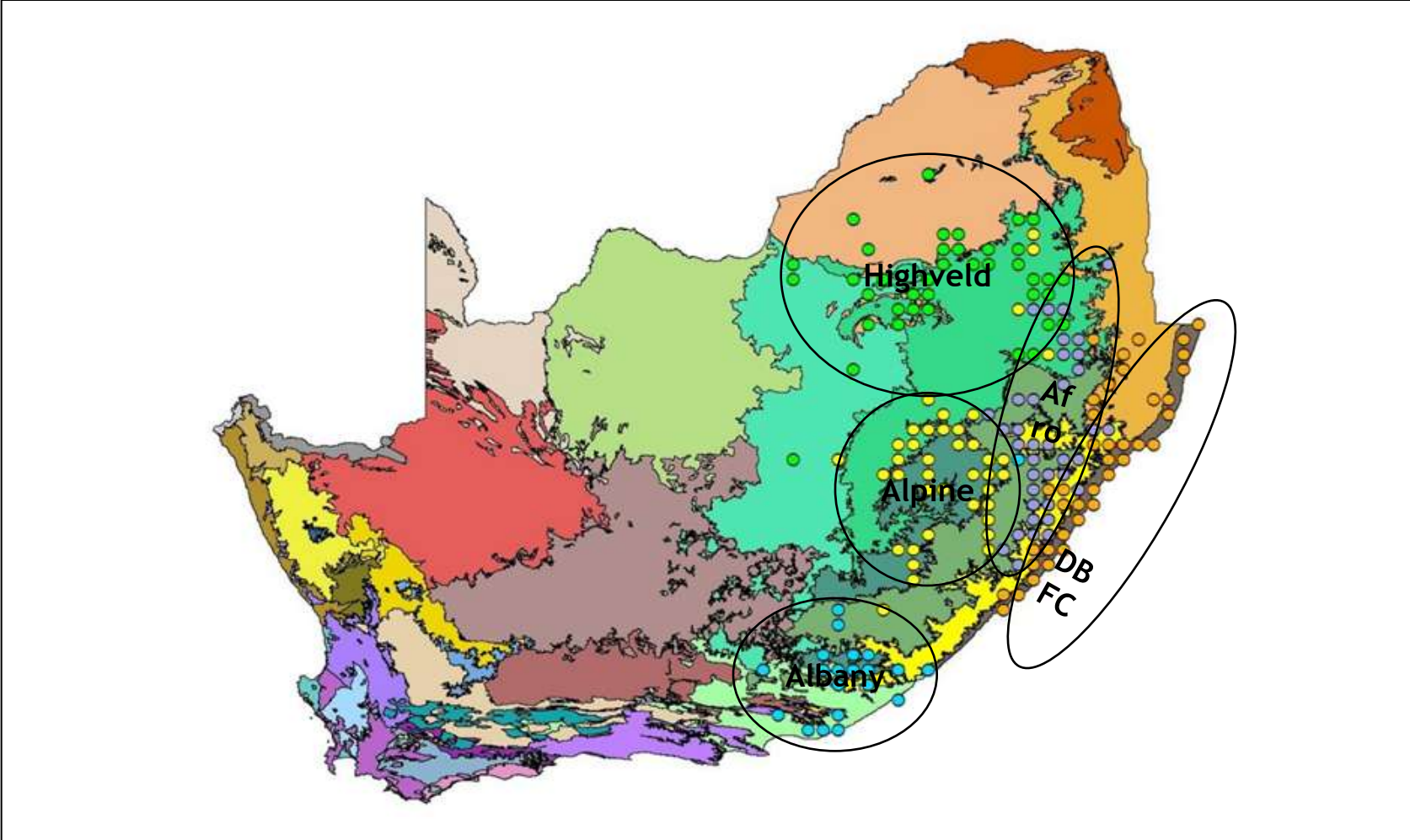
Resulted in 5 Main clusters

Phytochoria:

Large areas (10,000 km²) with largely similar plant species composition

Cluster	Cluster name
A	Sour and Mixed Veld Group (Medium to High Rainfall)
A1	Southern Afromontane
A2	Albany Centre
A3	Northern Highveld Region
A4	Drakensberg Alpine Centre
A5	Drakensberg Foothill & Coastal Region
B	Seasonal Rainfall Group (All year, winter and summer)
B1	Arid Western Region
B2	Lower Rainfall Cape Floristic Region
B3	Central Arid Region
B4	Generalist Group
B5	Summer Rainfall Region
B6	Northern and Northeastern Savanna Region
B7	Kalahari Bushveld Region
C	Higher Rainfall Cape Floristic Region
D	Savanna Group
D1	Central Bushveld Region
D2	Subtropical Lowveld & Mopane Region
E	Northern Mistbelt Forest

Cluster A: Sour and Mixed Veld Group (medium to high rainfall areas)
Bioregions (Rutherford *et al.* 2006)



Sour and Mixed Veld Group (medium to high rainfall areas)

Bioregions (Rutherford *et al.* 2006)
 RF; MinTemp, MaxTemp, Soil P & pH (ARC-ISCW 2006)
 5 highest occurring species

Northern Highveld Region	Drakensberg Foothill & Coastal Region	South. Afromontane	Drakensberg Alpine Centre	Albany Centre
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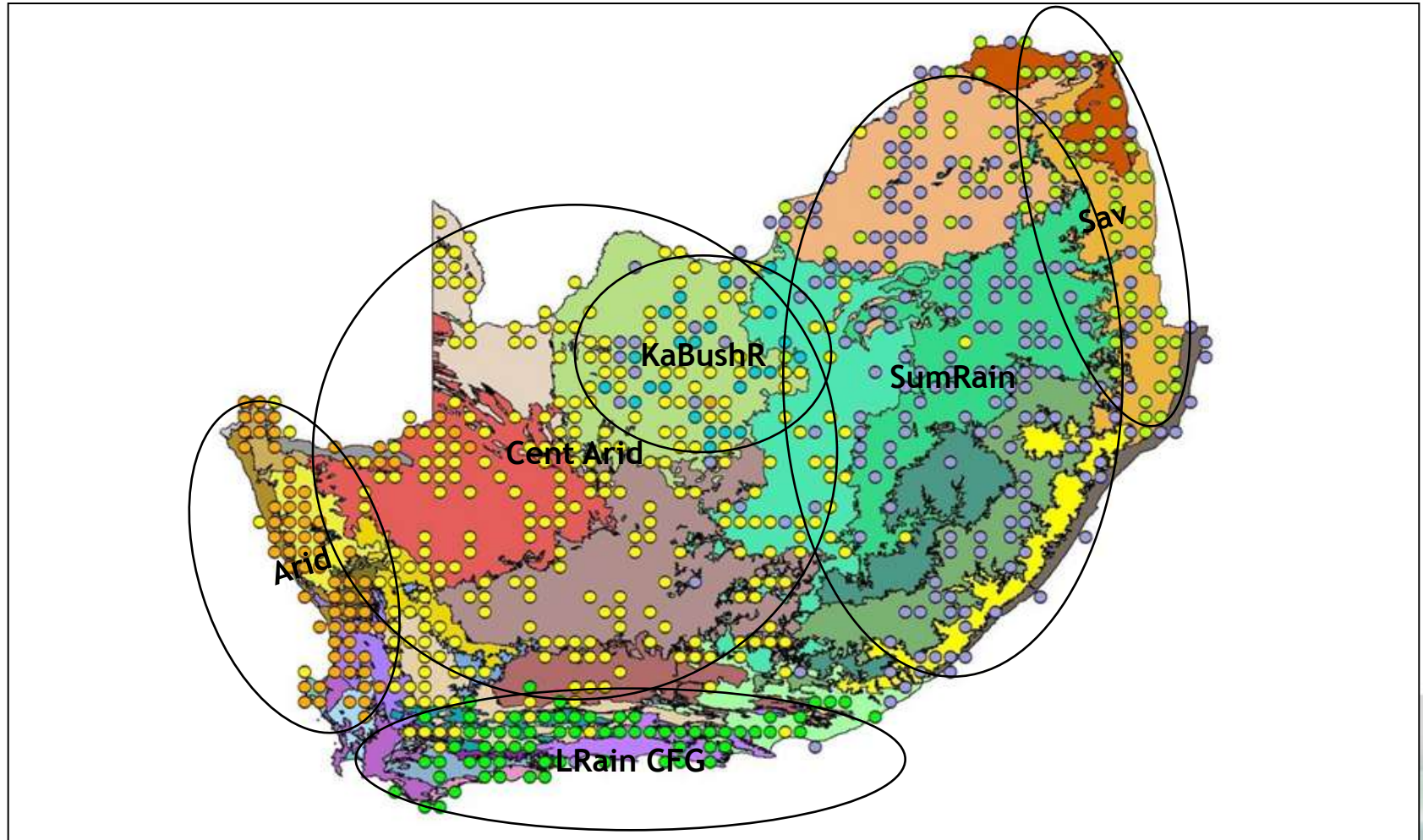
Mesic Highveld Grassland	Indian Ocean Coastal Belt	Mesic Highveld Grassland	Mesic Highveld Grassland	Albany & Sub Escarpment Grassland
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400–800 mm	>800 mm	600–1000 mm	>800 mm	400–800 mm
0–4 °C	>6°C	0–8°C	<2°C	2–8°C
25–29°C	25–29°C	25–29°C	<27°C	25–29°C
<10 mgkg ⁻¹	<10 mgkg ⁻¹	<10 mgkg ⁻¹	<10 mgkg ⁻¹	5–35 mgkg ⁻¹
<6.4	<6.4	<6.4	<6.4	<6.4

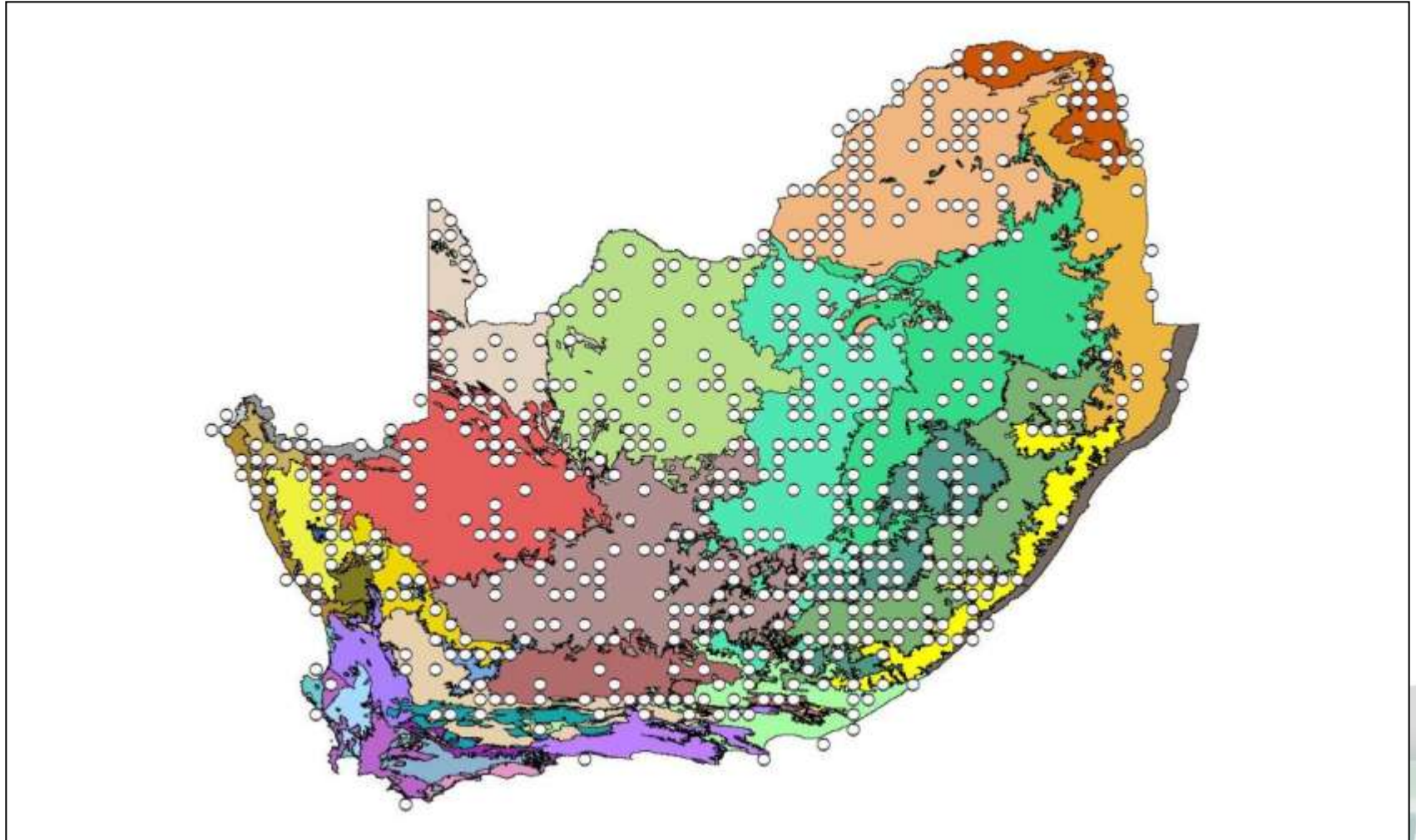
Northern Highveld Region	Drakensberg Foothill & Coastal Region	South. Afromontane	Drakensberg Alpine Centre	Albany Centre
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<i>Indigofera</i> <i>Rhynchosia</i> <i>Tephrosia</i> <i>Leobordea</i> <i>Elephantorrhiza</i>	<i>Zornia</i> <i>Chamaecrista</i> <i>Eriosema</i> <i>Acacia</i> <i>Dalbergia</i>	<i>Eriosema</i> spp. <i>Vigna</i> <i>Zornia</i>	<i>Lessertia</i> <i>Lotononis</i> spp. <i>Trifolium</i> <i>Argyrolobium</i>	<i>Indigofera</i> <i>Tephrosia</i> <i>Aspalathus</i> <i>Rhynchosia</i> <i>Trifolium</i>
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Cluster B: Seasonal Rainfall Group (All year, winter and summer)



Cluster B4: Generalist Group



Cluster B: Seasonal Rainfall Group (All year, winter and summer)

Arid Western Region	Central Arid Region	Lower-rainfall Cape Floristic Region	Kalahari Bushveld Region	Summer Rainfall Region	Northern and Northeastern Savanna Region
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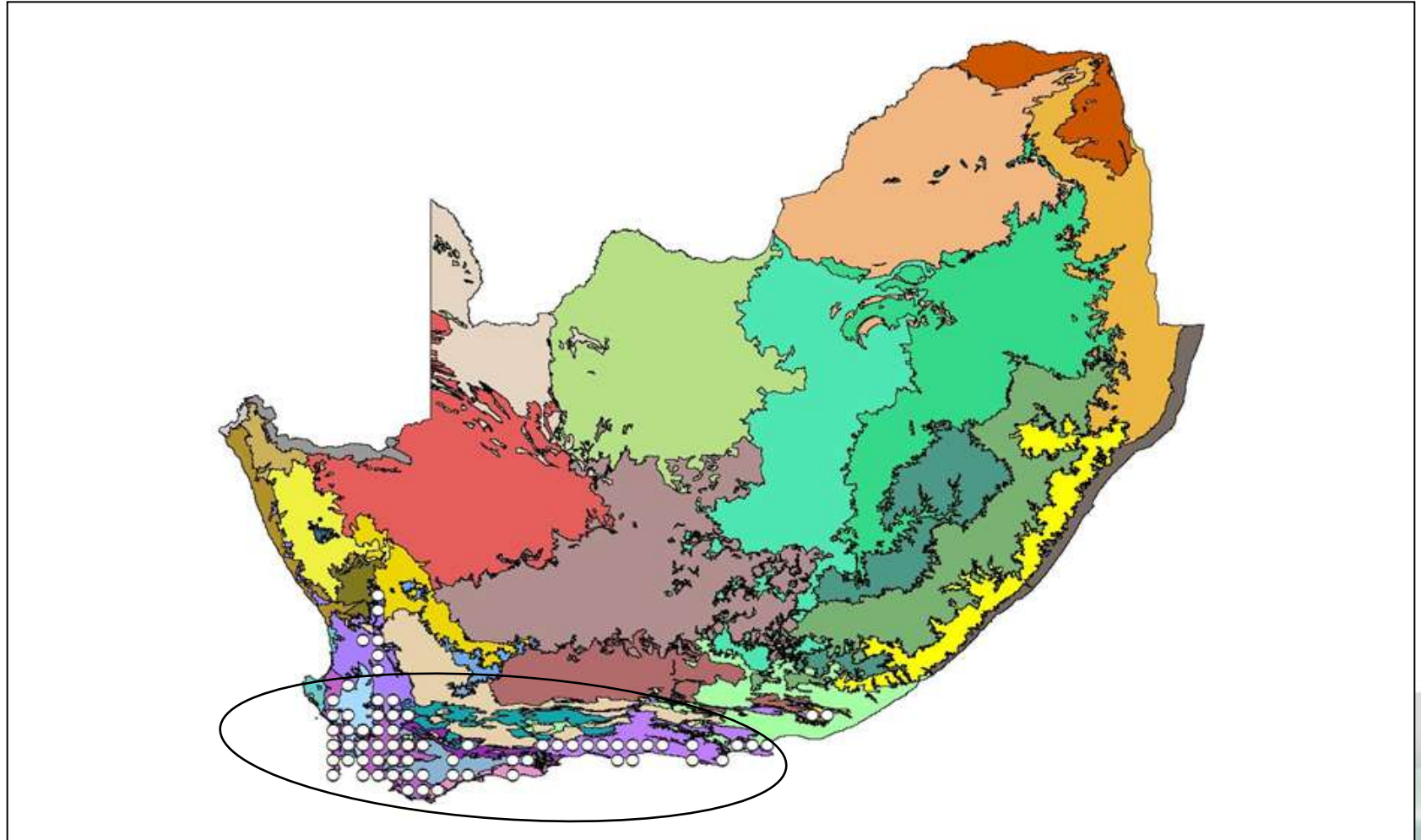
Namaqualand Hardeveld	Eastern Kalahari Bushveld	Albany Thicket & Eastern Fynbos Renosterveld	Eastern Kalahari Bushveld	Mesic Highveld Grassland	Central Bushveld & Lowveld
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<400 mm	<400 mm	200–600 mm	400–800 mm	400–800 mm	400–800 mm
>6°C	<2°C	2–8°C	<2°C	<2°C	>6°C
27–35°C	27–35°C	25–29°C	27–35°C	25–29°C	27–35°C
5–35 mgkg ⁻¹	>20 mgkg ⁻¹	5–35 mgkg ⁻¹	<10 mgkg ⁻¹	<10 mgkg ⁻¹	<10 mgkg ⁻¹
>7.5	>7.5	5.5–7.4	6.5–7.4	<6.4	5.5–7.4

Arid Western Region	Central Arid Region	Lower-rainfall Cape Floristic Region	Kalahari Bushveld Region	Summer Rainfall Region	Northern and Northeastern Savanna Region
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<i>Calobota</i> spp. <i>Sutherlandia</i> <i>Lessertia</i> <i>Lotononis</i>	<i>Indigofera</i> <i>Sutherlandia</i> <i>Melolobium</i> <i>Leobordea</i> <i>Lessertia</i>	<i>Aspalathus</i> spp. <i>Sutherlandia</i> <i>Lotononis</i>	<i>Indigofera</i> spp. <i>Tephrosia</i> <i>Senna</i>	<i>Rhynchosia</i> <i>Eriosema</i> <i>Trifolium</i> <i>Zornia</i> <i>Mundulea</i>	<i>Dichrostachys</i> <i>Peltophorum</i> <i>Tephrosia</i> <i>Ormocarpum</i> <i>Senna</i>
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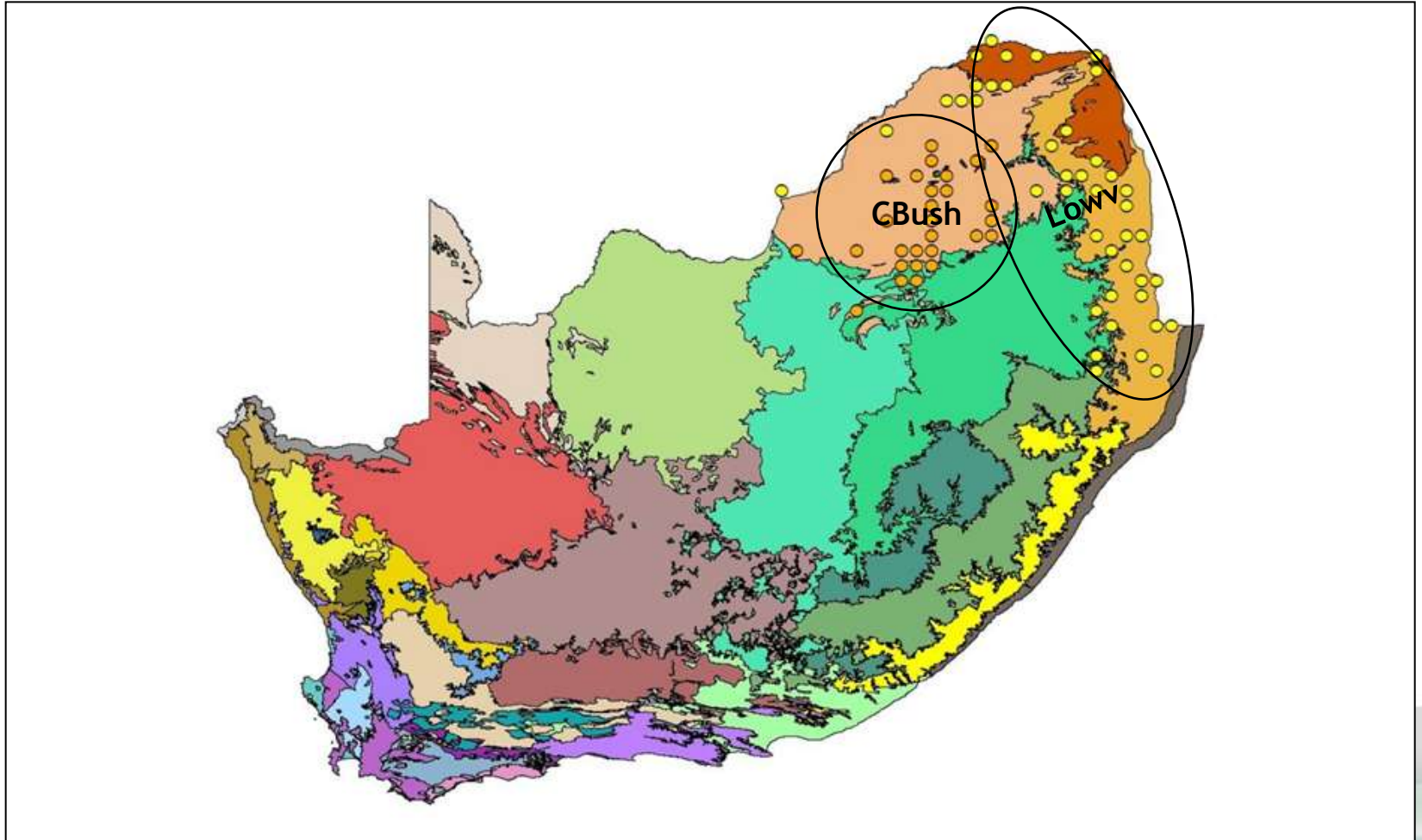
Cluster C: Higher Rainfall Cape Floristic Region



Cluster C: Higher Rainfall Cape Floristic Region

Eastern Fynbos Renosterveld
200–600 mm
2–8°C
25–29°C
5–35 mgkg ⁻¹
<6.4
<i>Aspalathus, Podalyria</i>

Cluster D: Savanna Group



Cluster D: Savanna Group

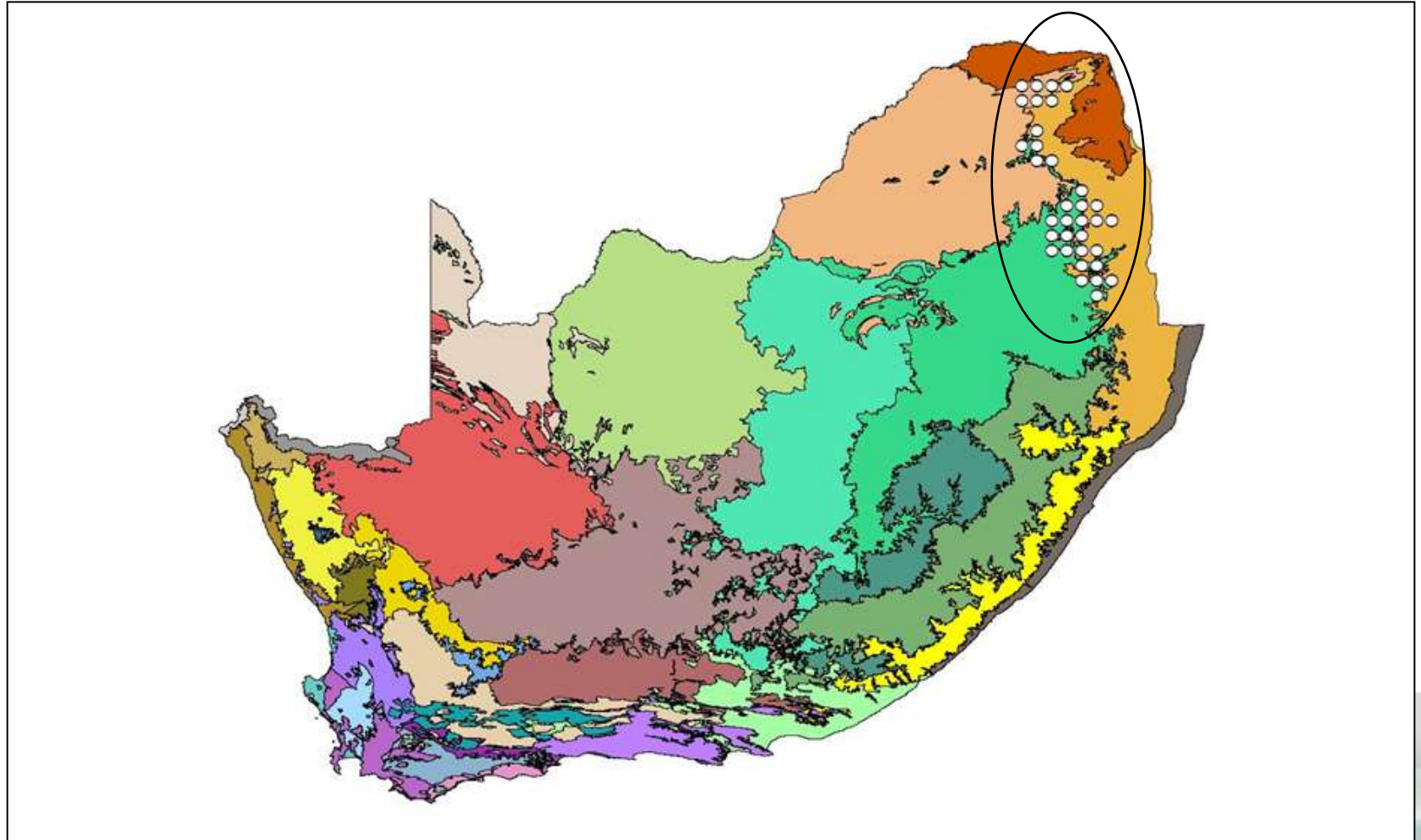
Central Bushveld Region	Subtropical Lowveld & Mopane Region
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Central Bushveld	Lowveld
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400–800 mm	400–800 mm
2–8°C	>6°C
27–35°C	27–35°C
<10 mgkg ⁻¹	<10 mgkg ⁻¹
<6.4	<6.4 & 5.5–7.4

<i>Acacia</i> <i>Mundulea</i> <i>Burkea</i> <i>Tephrosia</i> <i>Rhynchosia</i>	<i>Dichrostachys</i> <i>Ormocarpum</i> spp. <i>Mundulea</i> <i>Acacia</i>
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Cluster E: Northern Mistbelt Forest



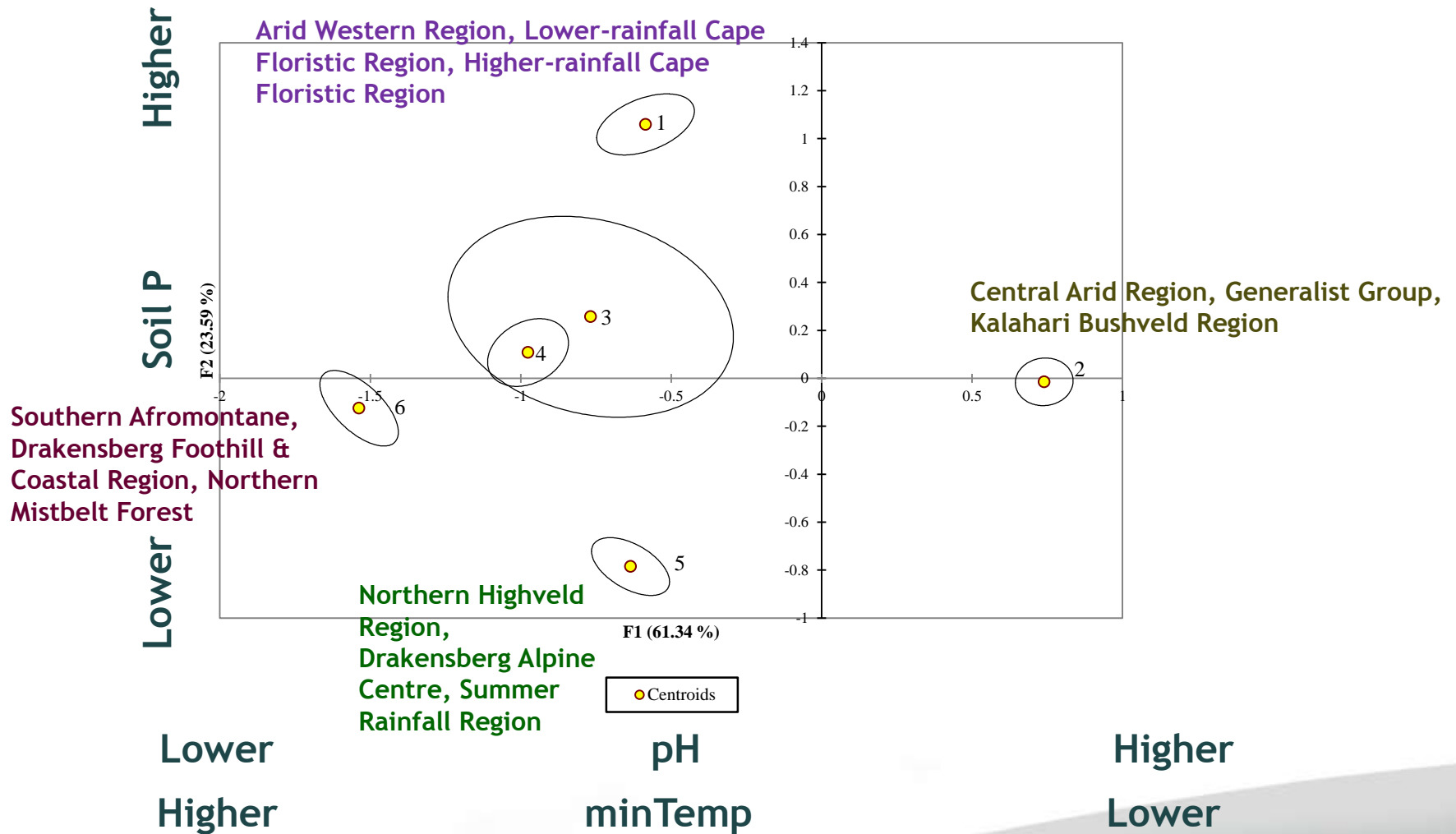
Cluster E: Northern Mistbelt Forest

Mesic Highveld Grassland
>800 mm
2–8°C
25–29°C
<10 mgkg ⁻¹
<6.4
<i>Acacia, Pseudarthria, Zornia, Bauhinia, Indigofera</i>

Floristic links identified by PHYTOTAB-PC using 20 key species of 16 clusters derived from XLSTAT analysis

Group	Cluster description
1	Arid Western Region (B1), Lower-rainfall Cape Floristic Region (B2), Higher-rainfall Cape Floristic Region (C)
2	Central Arid Region (B3), Generalist Group (B4), Kalahari Bushveld Region (B7)
3	Albany Centre (A2)
4	Northern and Northeastern Savanna Region (B6), Central Bushveld Region (D1), Subtropical Lowveld & Mopane Region (D2)
5	Northern Highveld Region (A3), Drakensberg Alpine Centre (A4), Summer Rainfall Region (B5)
6	Southern Afromontane (A1), Drakensberg Foothill & Coastal Region (A5), Northern Mistbelt Forest (E)

Discriminant Analysis for the PHYTOTAB-PC communities



Conclusions :

Higher Rainfall Cape Floristic Region & Northern Mistbelt Forest formed distinct Leguminosia

Generalist group & Summer Rainfall Region are non-distinct

The Northern and Northeastern Savanna Region's distinction from the Savanna Group is unfounded with similar climate and soil characteristics & key species

Soil pH, mean annual minimum temperatures and soil P are the main drivers for distinguishing between legume communities

Standard
Postage
South Africa

**Thank
you!**



UMBRELLA THORN ACACIA TORTILIS

1998