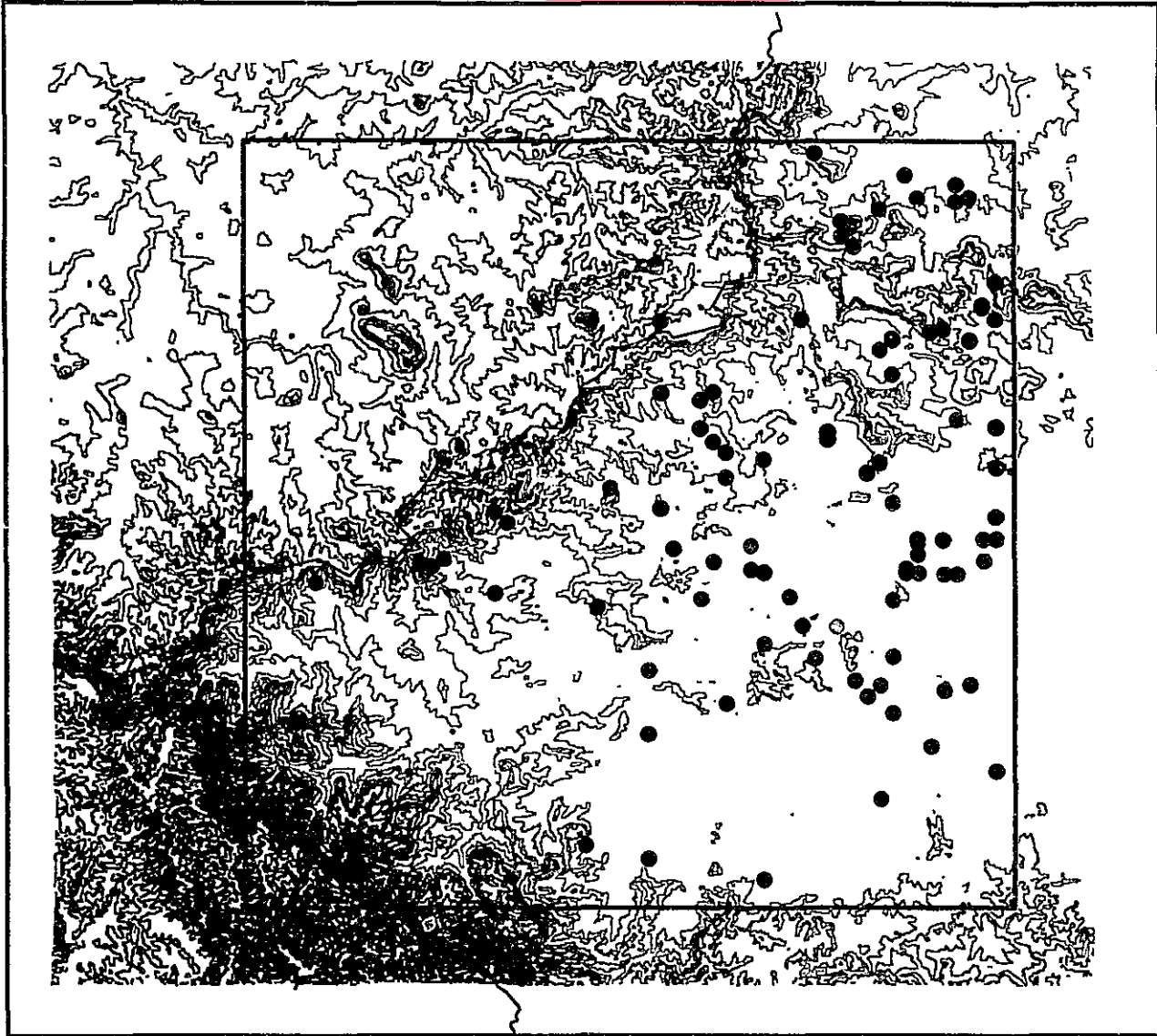


## Chapter 7: The Woodland Vegetation Type

The relevés representing the *Maytenus heterophylla* - *Acalypha angustata*- and *Maytenus heterophylla* - *Rhus pentheri* communities are separated by TWINSPAN from the rest of the data set to form the Woodland Vegetation Type (see Chapter 4). This Vegetation Type is dominated by woody species, although in some cases the vegetation merges into grassveld. As a result of the origin of the nutrient rich soil, namely from Dolerite, the vegetation can be classified as sweet veld, resulting in intensive grazing by cattle, causing changes in dominance of species in some communities. The result of this intensive grazing pressure on the vegetation is the creation of disturbed areas with forbs prominent in the herbaceous layer.

These woodlands are restricted to the crests and slopes of rocky hills in the eastern and central parts of the study area (Figure 7.1). The hills were formed from sills and dykes of Karoo Dolerite origin (Figure 7.2). Due to the small size of these dolerite dykes and sills, they are not mapped on the 1 : 1 000 000 Geological Map. Subsequently they are not identified by means of the ARC-INFO computer programme that was used to derive the geology represented in the sample plots. The Dolerite was, however, noted during the field survey. Karoo Dolerite is a dark-grey to nearly black, igneous rock, popularly known as “Ysterklip”, which intrude the sedimentary rocks of the Karoo Sequence. The occurrence and distribution of this rock is therefore mainly limited to the central Karoo Basin and the adjacent areas. The texture of dolerite varies considerably, mostly being fine- to medium grained, but coarse-grained types are also found.

A result of the woody nature of the communities where this vegetation type is located, a physiognomy different from the surrounding grassland areas is created. This vegetation consists of a grass layer with a shrubby woody element that becomes dominant in the case of the *Maytenus heterophylla* - *Rhus pentheri* community. The presence of the woody species *Maytenus heterophylla* is diagnostic to the Woodland Vegetation Type.

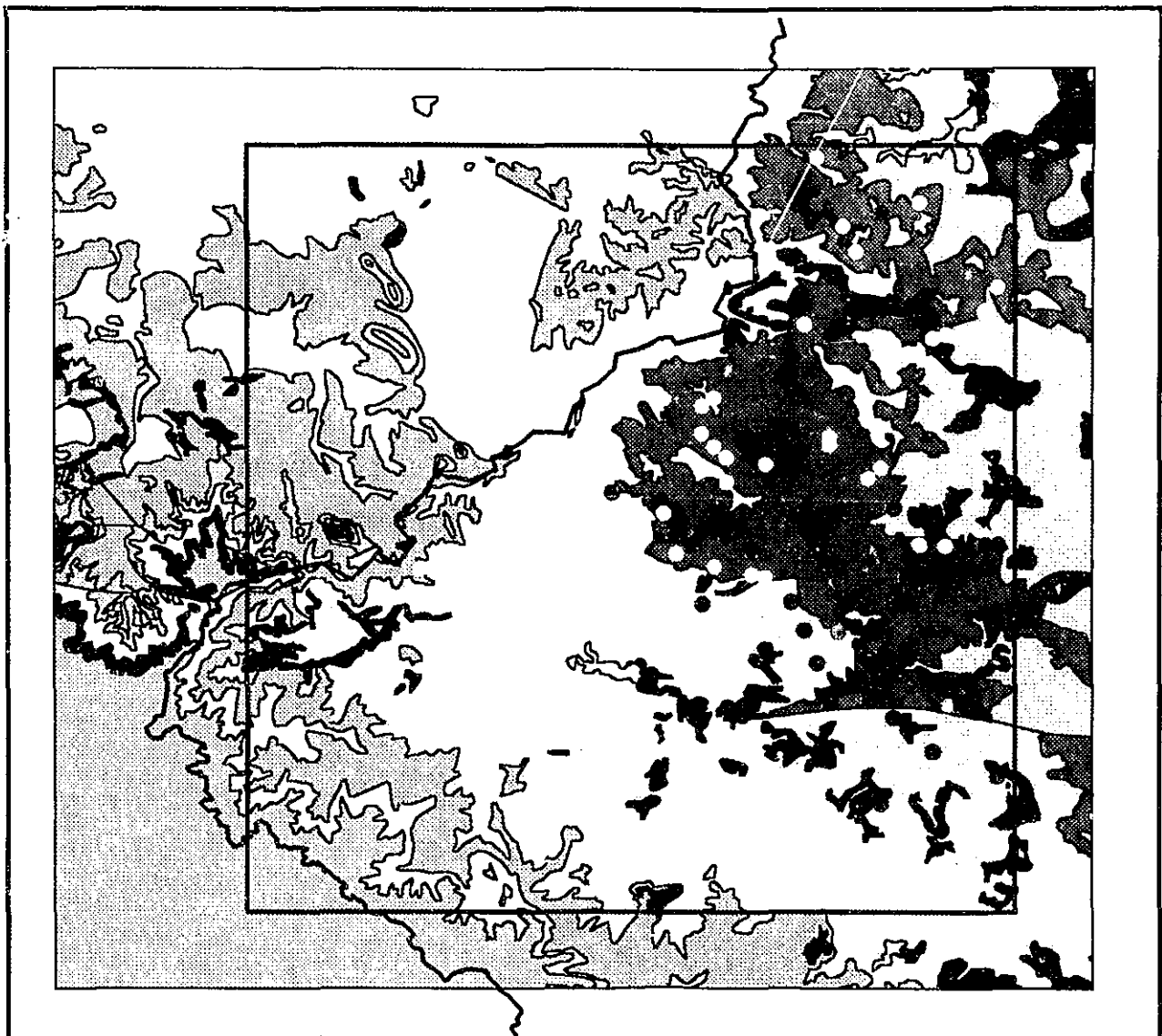


- ⊙ Ladysmith
  - Gridlines 28° - 29°S and 29° - 30°E
  - ▬ KwaZulu-Natal Boundary
  - Sample plots of the *Maytenus heterophylla* - *Acalypha angustata* community
  - Sample plots of the *Maytenus heterophylla* - *Rhus pentheri* community
- Altitude



- Altitude of the study area, contours 100m interval
- 750 - 1 100
  - 1 100 - 1 450
  - 1 450 - 1 850
  - 1 850 - 2 200
  - 2 200 - 2 550
  - 2 550 - 2 950
  - 2 950 - 3 300

**Figure 7.1: Distribution of the Woodland Vegetation Type sample plots in the study area.**



- Ladysmith
- Gridlines 28° - 29°S and 29° - 30°E
- ▤ KwaZulu-Natal Boundary
- Sample plots of the *Maytenus heterophylla* - *Acalypha angustata* community
- Sample plots of the *Maytenus heterophylla* - *Rhus pentheri* community

**Geological Formations**

- Beaufort
- Clarens
- ▨ Drakensberg
- Karoo
- Karoo Dolerite
- Molteno
- ▨ Tarkastad
- ▨ Volksrust
- Vryheid



**Figure 7.2: Distribution of the Woodland Vegetation Type sample plots in geological formations of the study area.**

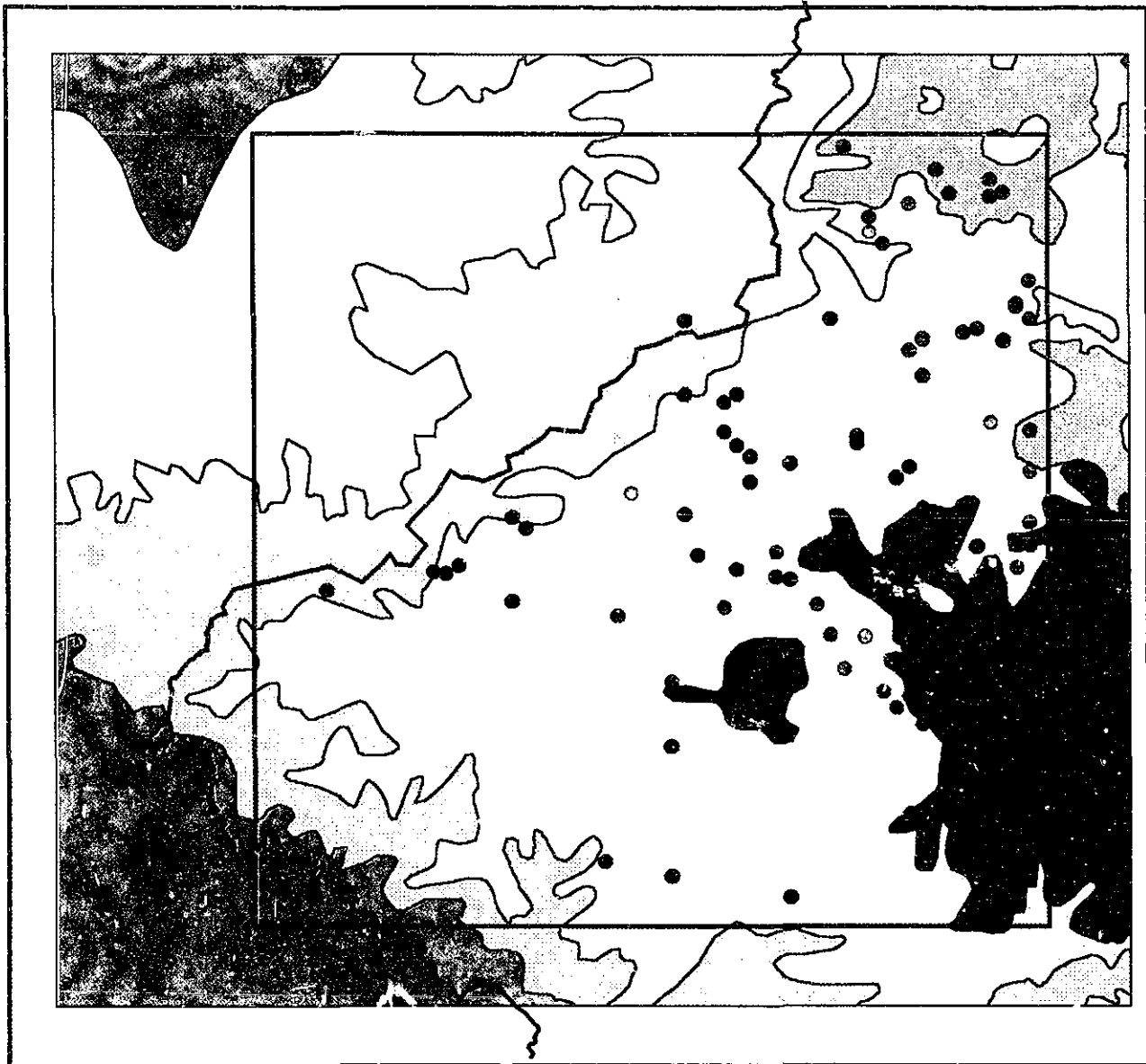
The absence of *Monocymbium cerasiiforme* separates this vegetation type from the Grassveld Vegetation Type. Various woody species occur abundantly in the sub-communities and variations of the Woodland Vegetation Type. The tree *Rhus dentata* differentiates this Vegetation Type from the Open Thornveld Vegetation Type. The Southern Tall Grassveld (Acocks #65) and the Valley Bushveld (Acocks # 23) are represented in the Woodland Vegetation Type.

The Woodland Vegetation Type is divided by TWINSPAN into the following communities:

- 7.1. The *Maytenus heterophylla* - *Acalypha angustata* community
- 7.2. The *Maytenus heterophylla* - *Rhus pentheri* community

Although the *Maytenus heterophylla* - *Acalypha angustata* community contain elements of grassveld, the geological substratum as well as the presence and absence of characteristic and diagnostic species resulted in the inclusion into the Woodland Vegetation Type. Acocks (1988) described this area as an open savanna with *Acacia* species in a sourish, mixed grassveld, abundant on dolerite. The vegetation on the hillsides is marginal to the Valley Bushveld and Scrub Forest, which merges into the Valley Bushveld (Acocks #23) (Figure 7.3). The *Maytenus heterophylla* - *Rhus pentheri* community is representative of the true Valley Bushveld.

Climate zones present in the Woodland Vegetation Type's distribution area include 374, 378, 384, 385, 386, 387 and 526 zones. Rainfall varies between 908.5 (387 climate zone) and 644.8 mm per annum (386 climate zone). The highest average temperature of 31.6°C is recorded in the 378 and 384 climate zones and the lowest of 0.8°C in the 386 climate zone (Institute for Soil, Water and Climate 1994). These climate zones are located in the central, eastern, southern and northern parts of the study area.



- Ladysmith
- Gridlines 28° - 29°S and 29° - 30°E
- ▤ KwaZulu-Natal Boundary
- Sample plots of the *Maytenus heterophylla* - *Acalypha angustata* community
- ⊙ Sample plots of the *Maytenus heterophylla* - *Rhus pentheri* community
- Acocks Veld Types**
- Cymbopogon - Themeda Veld (Sandy) (#48)
- ▨ Highland Sourveld and Doline Sourveld (#44)
- ▩ Highland Sourveld to Cymbopogon - Themeda: Transition (Eastern Free State Highveld) (#49)
- ▧ Natal Sour Sandveld (#66)
- ▩ Southern Tall Grassveld (#65)
- Themeda Veld to Cymbopogon - Themeda Veld Transition (Patchy) (#53)
- ▨ Themeda - Festuca Alpine Veld (#58)
- Valley Bushveld (#23)



**Figure 7.3: Distribution of the Woodland Vegetation Type sample plots in Acocks Veld Types of the study area.**

### **7.1 The *Maytenus heterophylla* - *Acalypha angustata* community**

Two Way Indicator Species Analysis (TWINSPAN) separated this community from the *Maytenus heterophylla* - *Rhus pentheri* community. The classification by means of TWINSPAN and subsequent refinement by means of Braun-Blanquet procedures, resulted in the recognition of the following sub-communities and variations (Table 9.1):

- 7.1.1           The *Trachypogon spicatus* - *Cheilanthes viridus* sub-community
- 7.1.1.1        The *Euclea crispa* - *Pelargonium luridum* variation
- 7.1.1.2        The *Aloe marlothii* - *Cheilanthes viridus* variation
- 7.1.2           The *Acacia sieberiana* - *Helichrysum rugulosum* sub-community
- 7.1.2.1        The *Cussonia paniculata* - *Melinis repens* variation
- 7.1.2.2        The *Diospyros lycioides* - *Cymbopogon excavatus* variation
- 7.1.2.3        The *Acacia sieberiana* - *Lippia javanica* variation
- 7.1.2.4        The *Elionurus muticus* - *Diheteropogon amplexans* variation
- 7.1.2.4.1      The *Eragrostis curvula* - *Diheteropogon amplexans* sub-variation
- 7.1.2.4.2      The *Scabiosa columbaria* - *Elionurus muticus* sub-variation
- 7.1.2.5        The *Hyparrhenia dregeana* - *Leucas glabrata* variation

The *Maytenus heterophylla* - *Acalypha angustata* community represents the Southern Tall Grassveld (#65) described by Acocks (1988), with some elements of the Natal Sour Sandveld (#66) (Figure 7.4). Granger (1996) described the greater part of this community as the Natal Central Bushveld (#25), lying at lower altitudes. However, elements of the North-eastern Mountain Grassland (Bredenkamp *et. al.* 1996c) (#43) and the Wet Cold Highveld Grassland (Bredenkamp *et. al.* 1996a) (#41) both present at higher altitudes, are also found (Figure 7.5).



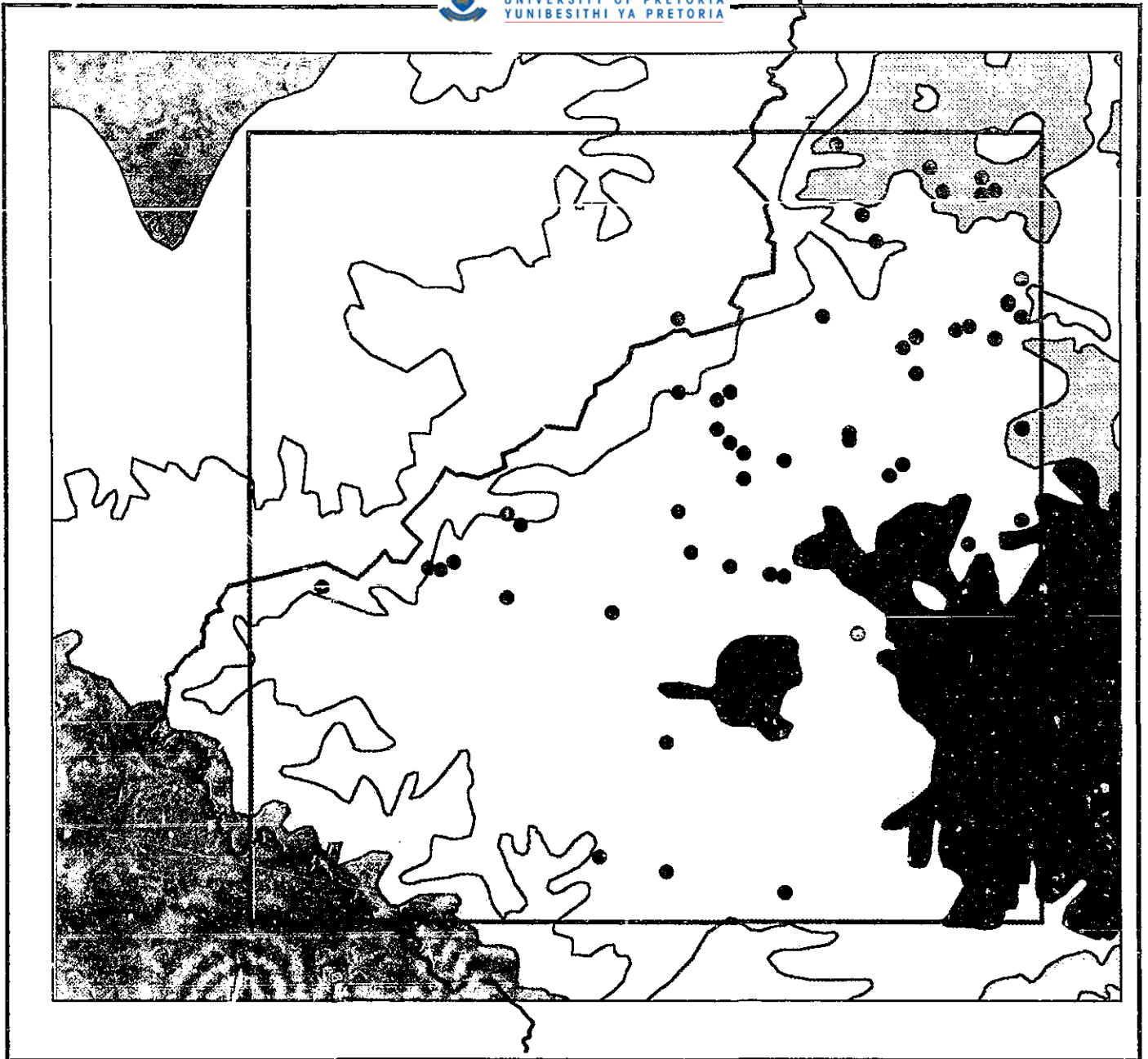
Sample plots of this community are located on slopes of rocky hills. A high degree of rockiness is characteristic, except for the *Hyparrhenia dregeana* - *Leucas glabrata* variation. Soils represent the Mispah form (Orhtic A, hard rock) (Macvicar *et. al.* 1977). The vegetation of the rocky hills tends to be open with shrubby elements of woody species. The woody layer is less prominent than in the *Maytenus heterophylla* - *Rhus pentheri* community, mostly found in the Valley Bushveld (Acocks #23). The characteristic species *Acalypha angustata* (Species group A) is widely distributed throughout the study area and is associated with open grassveld.

These communities are difficult to reach due to steep slopes and high degree of rockiness. The geology comprises of Karoo Dolerite sills and dykes, present as rocky hills (Figure 7.6). The vegetation of this community is over-utilised, thus causing encroachment of woody species not normally present. This over-utilisation is also confirmed by the prominent forbs in the herbaceous layer.

This community is distinguished from the *Maytenus heterophylla* - *Rhus pentheri* community by the presence of the forbs *Acalypha angustata* and *Leonotis ocymifolia* (Species group A) (Table 7.1). The general species present (Species group W) as well as species that are prominent in most of the sub-communities and variations indicate that this community should be regarded as grassveld that is transitional to the *Maytenus heterophylla* - *Rhus pentheri* community. Many of these species are widely distributed throughout the grassveld in the study area. A woody succulent species that is conspicuous on most hillslopes is *Aloe marlothii* (Species group R), creating a conspicuous physiognomy.

Climate zones that are present in the distribution area of the *Maytenus heterophylla* - *Acalypha angustata* community includes zones 378, 384, 385, 387 and 526 (Institute for Soil, Climate and Water 1994). Rainfall varies from a minimum of 695.9 (climate zone 526) to a maximum of 908.5 mm (climate zone 387) per annum. A moisture gradient is present in this community.

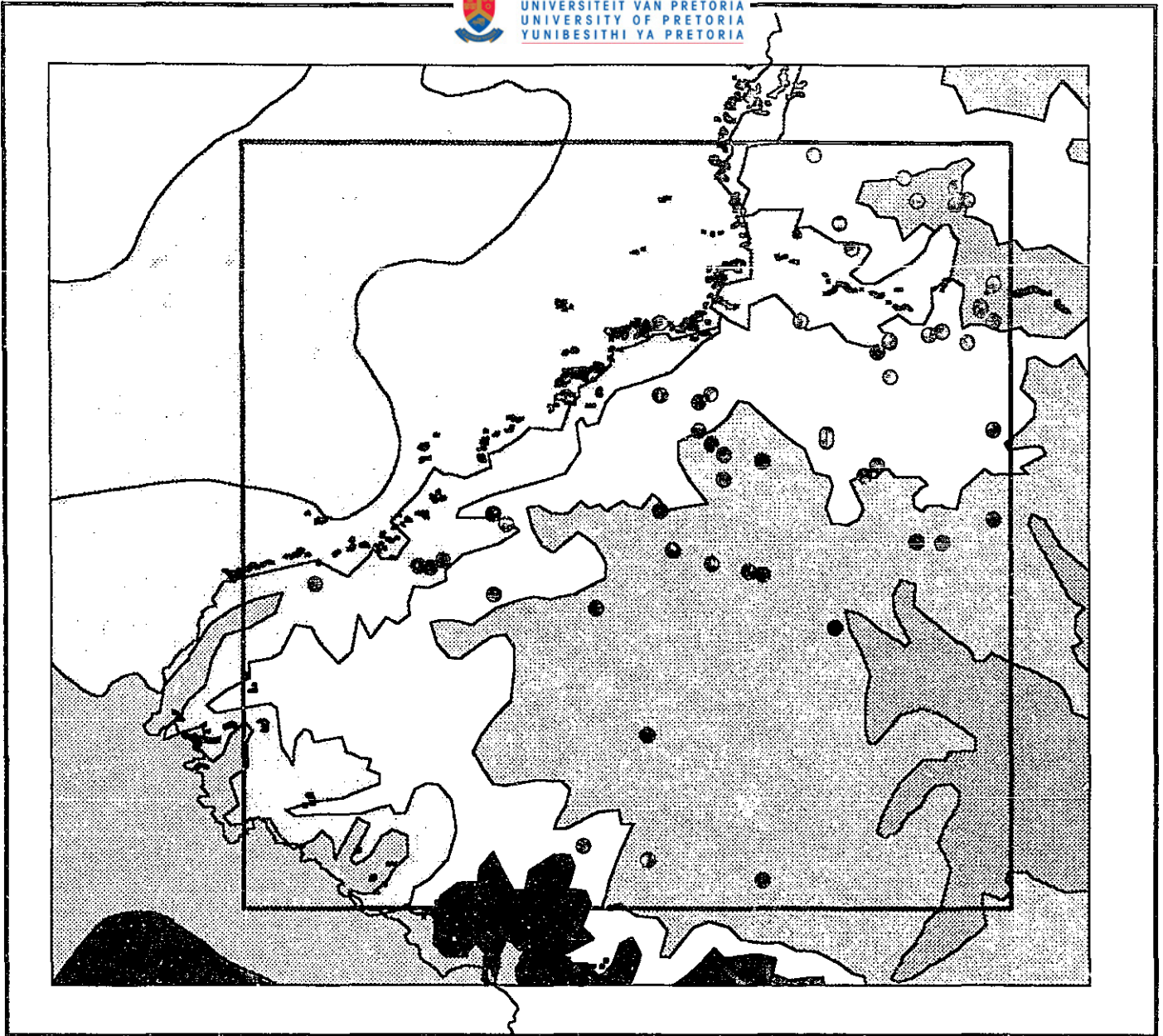




- Ladysmith
  - Gridlines 28° - 29°S and 29° - 30°E
  - ∇ KwaZulu-Natal Boundary
  - Sample plots of the *Maytenus heterophylla* - *Acalypha angustata* community
- Acocks Veld Types**
- Cymbopogon - Themeda Veld (Sandy) (#48)
  - Highland Sourveld and Dohne Sourveld (#44)
  - Highland Sourveld to Cymbopogon - Themeda Transition (Eastern Free State Highveld) (#49)
  - Natal Sour Sandveld (#66)
  - Southern Tall Grassveld (#65)
  - Themeda Veld to Cymbopogon - Themeda Veld Transition (Patchy) (#53)
  - Themeda - Festuca Alpine Veld (#58)
  - Valley Bushveld (#23)



**Figure 7.4: Distribution of the *Maytenus heterophylla* - *Acalypha angustata* community sample plots in Acocks Veld Types of the study area.**



- Ladysmith
  - Gridlines 28° - 29°S and 29° - 30°E
  - ▤ KwaZulu-Natal Boundary
  - Sample plots of the *Maytenus heterophylla* - *Acalypha angustata* community
- Low and Rebelo Vegetation Types**
- Afromontane Forest (#2)
  - ▨ Valley Thickets (#5)
  - ▨ Natal Central Bushveld (#25)
  - Moist Cool Highveld Grassland (#39)
  - ▨ Moist Cold Highveld Grassland (#40)
  - Wet Cold Highveld Grassland (#41)
  - ▨ Moist Upland Grassland (#42)
  - North-eastern Mountain Grassland (#43)
  - ▨ Afro Mountain Grassland (#45)
  - ▨ Alti Mountain Grassland (#46)



**Figure 7.5: Distribution of the *Maytenus heterophylla* - *Acalypha angustata* community sample plots in Low and Rebelo Vegetation Types of the study area.**

Certain sample plots occur in the dry northern and central eastern parts, while others are present in the central and southern parts, where rainfall is higher. Some sample plots are located in the high mountain areas with a high rainfall and mist. The average rainfall figures of the different climate zones are relative low when compared to a rainfall of 1510.8 mm per annum in the 360 climate zone. The 360 climate zone is situated in the western part of the study area in the high mountain regions.

Only small differences in altitude were noted in the different variations of the *Maytenus heterophylla* - *Acalypha angustata* community. Altitude ranges from 1 000 - 1 400 m. Only in some cases are altitudinal differences important in differentiating between variations. Climatic and geographical differences are however important in determining the distribution of the variations.

#### **7.1 1. The *Trachypogon spicatus* - *Cheilanthes viridis* sub-community**

Sample plots representing this sub-community are located on the crests and slopes of rocky hills in the eastern central and northeastern parts of the study area. Shallow soils of the Mispah soil form are predominantly found, rockiness is high and the rock cover varies between 15 and 60%. The size of the rocks is in the 500 - 1 000 mm class. Species that are diagnostic to this community, include the xerophytic fern *Cheilanthes viridis*, the woody species *Euclea crispa* and the forb *Rhynchosia reptabunda* as well as the grass species *Tristachya leucothrix* and the dwarf shrub *Rhus discolor* (Species group B) (Table 9.1).

This sub-community is found in the Southern Tall Grassveld (#65), described by Acocks (1988). This correlates with the North-eastern Mountain Grassland (#43) described by Bredenkamp *et. al.* (1996c) as predominantly grassland on shallow lithosoils, derived from a variety of rock types.

Utilisation is severe and most sample plots represent disturbed areas, with species like *Conyza podocephala* (Species group I) and various other forb species present. Due to

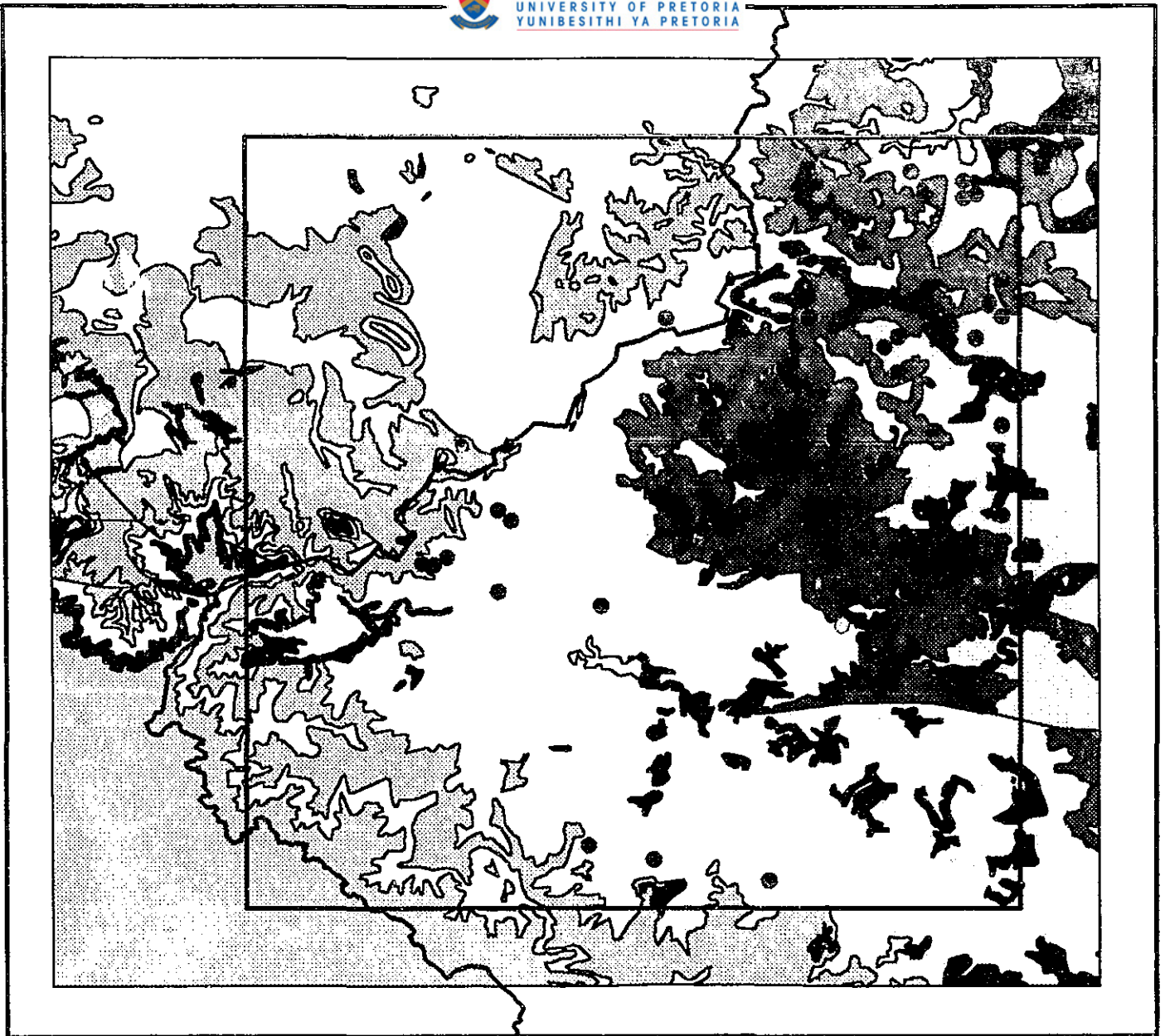
differences in floristic composition, altitude, geographical position and climatic influences, this sub-community is divided into two variations.

#### **7.1.1.1 The *Euclea crispa* - *Pelargonium luridum* variation**

Sample plots representing this variation are located on crests and slopes (20°) of rocky hills in the northeastern part of the study area. The altitude ranges from 1 200 to 1 400 m a.m.s.l. The Southern Tall Grassveld (#65), described by Acocks (1988) is represented. Bredenkamp *et. al.* (1996c) described this vegetation as North-eastern Mountain Grassland (#43). The *Euclea crispa* - *Pelargonium luridum* variation is found in the 387 climate zone with an average rainfall of 908.5 mm per annum. Mean average temperatures vary between a maximum of 26.5 °C in January and a minimum of 4.4 °C during July. Soils are shallow and rock cover varies between 31 and 60%, rocks of up to 1 000 mm diameter are found.

This variation is characterised by Species Group C (Table 7.1), consisting of the characteristic forb species *Pelargonium luridum*, *Protasparagus* spp., *Chaetacanthus setiger*, *Eriospermum* spp. and *Rubus rigidus*. Prominent species occurring in this variation, but not found in the *Aloe marlothii* - *Cheilanthes viridus* variation, include the grass species *Eragrostis racemosa*, *Eragrostis curvula* (Species group W) and the forb species *Lactuca capensis* and *Crabbea hirsuta* (Species group J). It is further distinguished by the absence of species groups R and V.

The grazing intensity is not severe, partly as a result of inaccessibility, subsequently a high vegetation cover is noted. However, the presence of many forbs and unpalatable grass species, such as *Paspalum dilatatum* (Species group J), *Melinis repens* and *Cymbopogon excavatus* (Species group W) is an indication that the vegetation of this variation is indeed disturbed to a certain state.



- Ladysmith
  - Gridlines 28° - 29°S and 29° - 30°E
  - ▤ KwaZulu-Natal Boundary
  - Sample plots of the *Maytenus heterophylla* - *Acalypha angustata* community
- Geological Formations**



- Beaufort
- Clarens
- ▨ Drakensberg
- Karoo
- Karoo Dolerite
- Molteno
- ▨ Tarkastad
- ▨ Volksrust
- Vryheid

**Figure 7.6: Distribution of the *Maytenus heterophylla* - *Acalypha angustata* community sample plots in geological formations of the study area.**

#### **7.1.1.2 The *Aloe marlothii* - *Cheilanthes viridus* variation**

The absence of species group C and the presence of species groups R and V (Table 7.1) distinguish this variation from the *Euclea crispa* - *Pelargonium luridum* variation. Sample plots of this variation occur at altitudes (1 000 to 1 200 m a.m.s.l.) lower than the *Euclea crispa* - *Pelargonium luridum* variation and under slightly drier conditions. Sample plots representing this variation are present on the crests and slopes of rocky hills distributed throughout the eastern central parts of the study area. Various climate zones are represented, the average rainfall is however lower than in the *Euclea crispa* - *Pelargonium luridum* variation (650 - 750 mm per annum) (Institute for Soil, Climate and Water 1994). Slopes of 20° incline, rocks with diameter of 1 000 mm and cover of 40% are present in this variation.

Utilisation and grazing in this variation varies considerably, from areas with little evidence of grazing to sample plots representing a disturbed condition. This is evident in the many forb species and individuals that are present, but not necessarily dominating the vegetation. Prominent species include the grasses *Hyparrhenia hirta*, *Melinis repens* and *Cymbopogon excavatus* (Species group W), the fern *Cheilanthes viridus* (Species group B), the woody succulent *Aloe marlothii* (Species group R) and *Rhus dentata* (Species group W). This variation is poor in species.

#### **7.1.2 The *Acacia sieberiana* - *Helichrysum rugulosum* sub-community**

This sub-community is characterised by the presence of Species Group D with the characteristic species *Helichrysum rugulosum*, *Setaria sphacelata*, *Hypoxis rigidula*, *Sida rhombifolia*, *Solanum elaeagnifolium*, *Hypoxis iridifolia* and *Acacia caffra*, as well as the absence of Species Groups B and C (Table 7.1).

The *Acacia sieberiana* - *Helichrysum rugulosum* sub-community is found on the crests and slopes of rocky hills with a well developed herbaceous layer. The woody layer is represented by a few tree species, namely *Cussonia paniculata* (Species group F), *Grewia occidentalis* (Species group P), *Aloe marlothii* (Species group R), *Diospyros lycioides*,

*Cephalanthus natalensis* (Species group S), *Rhus dentata* and *Acacia sieberiana* (Species group W). Most of these species are present as shrubs and seedlings. Various climate zones and veld types are represented in the distribution area of this sub-community. The high degree of rockiness (30 - 50 % cover) resulted in the presence of the Mispah form. The average rock size varies between 250 and 1000 mm. This sub-community is divided into five variations.

#### **7.1.2.1 The *Cussonia paniculata* - *Melinis repens* variation**

This variation is situated in the central and eastern parts of the study area at altitudes ranging from 1 000 to 1 200 m a.m.s.l. Sample plots are located on crests and slopes of rocky hills. The average rock cover is more than 45% and rocks are larger than 500 mm. The vegetation, described by Granger (1996) as Natal Central Bushveld (#25), is an open savanna with scattered *Acacia* species and secondary grassland, dominated by *Hyparrhenia hirta*.

The woody component is well developed, with the trees *Cussonia paniculata* (Species group F), *Aloe marlothii* (Species group R), *Maytenus heterophylla* (Species group A), *Rhus dentata* and *Acacia sieberiana* (Species group W) prominent. The herbaceous layer is prominent with *Helichrysum rugulosum* (Species group D), *Hermannia depressa* (Species group O) and various other forb species.

Prominent grass species that occur in this variation include *Aristida congesta* ssp. *barbicollis* (Species group N), *Themeda triandra* (Species group V), *Hyparrhenia hirta*, *Melinis repens* and *Cymbopogon excavatus* (Species group W). No diagnostic species group is recognised, but this variation is distinguished from other variations in the *Acacia sieberiana* - *Helichrysum rugulosum* sub-community due to the absence of species groups G, H, K, L, M, P, T and U (Table 7.1).

### 7.1.2.2 The *Diospyros lycioides* - *Cymbopogon excavatus* variation

Sample plots of this variation are distributed throughout the central and northern parts of the study area, and are situated on the crests and slopes of rocky hills in the Natal Central Bushveld (#25) (Granger 1996). A high cover of rocks is present (60 %), with sizes in the order of 500 mm diameter. Sample plots of this variation are distributed in various climate zones, the average rainfall is 650 to 750 mm per annum. A high degree of utilisation, with further habitat factors like rockiness, steep slope incline and shallow soils combined, result in a vegetation that is sensitive to grazing. The effect of grazing is evident in the numerous forbs present, including *Acalypha angustata* (Species group A), *Helichrysum rugulosum* (Species group D), *Conyza podocephala* (Species group J), *Berkheya radula* (Species group N), *Hermannia depressa*, *Phyllanthus parvulus* (Species group O), *Scabiosa columbaria* and *Schkuhria pinnata* (Species group S).

The *Diospyros lycioides* - *Cymbopogon excavatus* variation is characterised by species group E (Table 7.1). Woody species occurring in this variation include *Grewia occidentalis* (Species group P), *Diospyros lycioides* (Species group S), *Rhus dentata* and *Acacia sieberiana* (Species group W). This variation is grassland being invaded by tree species as a result of poor agricultural practises.

### 7.1.2.3 The *Acacia sieberiana* - *Lippia javanica* variation

Various climate zones and veld types are represented in this variation. Sample plots are distributed in the northern and eastern parts, also in the high altitude mountains in the west of the study area. As is characteristic of the *Maytenus heterophylla* - *Acalypha angustata* community, steep and rocky slopes also prevail in this variation. The rock cover is more than 45% and rocks can be as big as 1 000 mm diameter. Utilisation is severe and this is reflected in many forbs in the herbaceous layer.

The *Acacia sieberiana* - *Lippia javanica* variation is characterised by species group G (Table 7.1). The forb layer is prominent, with species like *Helichrysum rugulosum* (Species group D), *Lippia javanica*, *Rhabdosiella calycina* (Species group G),



*Hermannia depressa* (Species group O), *Anthospermum rigidum* (Species group S), *Lantana rugosa* and *Bidens pilosa* (Species group W) prominent. Other species that have a high cover include the grass species *Themeda triandra* (Species group V), *Hyparrhenia hirta*, *Eragrostis plana*, *Hyparrhenia dregeana*, *Melinis repens*, *Cymbopogon excavatus* (Species group W) as well as the woody species *Diospyros lycioides* (Species group S), *Rhus dentata* and *Acacia sieberiana* (Species group W).

#### **7.1.2.4 The *Elionurus muticus* - *Diheteropogon amplexans* variation**

This variation is distributed through the central, central-western and southern parts of the study area, in various climate zones and veld types. The soil form is exclusively of the Mispah form as a result of a high degree of rockiness. Steep slopes and crests of rocky hills with a dominant herbaceous layer and few woody species are characteristic of this variation, as indicated by the characteristic species group K, consisting of *Elionurus muticus*, *Dicoma anomala*, *Convolvulus sagittatus*, *Aristida meridionalis* and *Rhus pentheri* (Table 7.1).

Species that have a high cover in this variation are the grasses *Trachypogon spicatus* (Species group W), *Themeda triandra* (Species group V), *Hyparrhenia hirta*, *Cymbopogon excavatus*, *Diheteropogon amplexans* and *Eragrostis curvula* (Species group W). The forbs *Acalypha angustata* (Species group A), *Chaetacanthus costatus*, *Anthospermum rigidum* and *Scabiosa columbaria* (Species group S), the woody succulent *Aloe marlothii* (Species group R) and the woody species *Diospyros lycioides* (Species group S) and *Rhus dentata* (Species group W) are also prominent.

Differences in climate as well as grazing intensity, veld management in the past and subsequently a slight difference in species composition caused the development of two sub-variations.

#### 7.1.2.4.1 The *Eragrostis curvula* - *Abildgaardia ovata* sub-variation

This sub-variation is characterised by species group L and is distinguished from the *Scabiosa columbaria* - *Aster peglerae* sub-variation by the presence of species groups M, N and O as well as the absence of the woody species *Grewia occidentalis* (Species group P) (Table 7.1). Prominent grasses in this sub-variation include *Elionurus muticus* (Species group K), *Trachypogon spicatus* (Species group W), *Themeda triandra* (Species group V), *Hyparrhenia hirta*, *Melinis repens*, *Cymbopogon excavatus*, *Diheteropogon amplexans* and *Eragrostis curvula* (Species group W). The forbs *Turbina oblongata* (Species group N), *Hermannia depressa* (Species group O), *Scabiosa columbaria* (Species group S), the woody succulent *Aloe marlothii* (Species group R) and the tree *Acacia sieberiana* (Species group A) have high cover abundance values.

This sub-variation is distributed throughout the central western and southern parts of the study area, predominantly in the 378 climate zone with an average rainfall of 707.8 mm per annum. This is lower than the average rainfall of the *Scabiosa columbaria* - *Aster peglerae* sub-variation (850.00 mm per annum) (Institute for Soil, Climate and Water 1994). The vegetation of the *Eragrostis curvula* - *Abildgaardia ovata* sub-variation is associated with open rocky hills in the Southern Tall Grassveld (Acocks 1988) (#65) or the Natal Central Bushveld (Granger 1996) (#25). Few woody elements, except for *Aloe marlothii* (Species group R), *Rhus dentata*, *Acacia sieberiana* (Species group W) and *Diospyros lycioides* (Species group S) are present.

Slopes on the rocky hills are steep, up to 25°, and the rockiness percentage of the soil surface is more than 46%, with rocks exceeding 500 mm diameter. Grazing is severe, but veld condition is good with grass species, such as *Trachypogon spicatus* (Species group W), *Themeda triandra* (Species group V), *Hyparrhenia hirta*, *Diheteropogon amplexans* and *Eragrostis curvula* (Species group W) dominant.

#### 7.1.2.4.2 The *Scabiosa columbaria* - *Aster peglerae* sub-variation

This sub-variation is found on slopes of rocky hills, comprising the Karoo Dolerite geological Formation. Soils are shallow and of the Mispah soil form (Macvicar *et. al.* 1977), rockiness is characteristically high (40%) and the rocks are up to 1 000 mm diameter. Sample plots of this variation are situated in the North-eastern Mountain Grassland (#43), described by Bredenkamp *et. al.* (1996c) and the Highland Sourveld (#44), described by Acocks (1988) as a pure grassveld with scrubbiness on the slopes. The 384 climate zone, with an average rainfall of 850.0 mm per annum is represented.

The vegetation has been utilised more severely than the *Diheteropogon amplexans* - *Abildgaardia ovata* sub-variation, this is noticeable in the lower presence of palatable grass species mentioned in the *Eragrostis curvula* - *Abildgaardia ovata* sub-variation. Unpalatable grass species with a high cover such as *Elionurus muticus* (Species group K), *Melinis repens* and *Cymbopogon excavatus* (Species group W), with various herbaceous species, such as *Acalypha angustata* (Species group A), *Aster peglerae* (Species group Q), *Chaetacanthus costatus* and *Scabiosa columbaria* (Species group S) occur in this sub-variation.

#### 7.1.2.5 The *Hyparrhenia dregeana* - *Leucas glabrata* variation

Sample plots representing this variation are located on hill slopes situated in the 384 climate zone with an average rainfall of 850.0 mm per annum. Rocks are absent and soils are deep, yellow and grey sandy-loam, derived from sandstone and shales of the Beaufort Group. This variation is situated in the Wet Cold Highveld Grasslands (#41), described by Bredenkamp *et. al.* (1996a) as moderately dense grassland, dominated by grasses.

A well developed woody component is present, consisting of *Acacia caffra* (Species group D) and *Acacia sieberiana* (Species group W), as well as a prominent grass layer of *Themeda triandra* (Species group V), *Hyparrhenia hirta*, *Cymbopogon excavatus*, *Eragrostis curvula* and *Hyparrhenia dregeana* (Species group W). This variation is characterised by the presence of species group T as well as the absence of species groups

B, C and E to S (Table 7.1). Very few forb species are present, because of the dominant grass layer, with only *Acalypha angustata* (Species group A), *Sida rhombifolia*, *Hypoxis iridifolia* (Species group D), *Leucas glabrata* (Species group T), *Berkheya setifera* (Species group U) and *Tagetes minuta* (Species group W) occurring frequently.

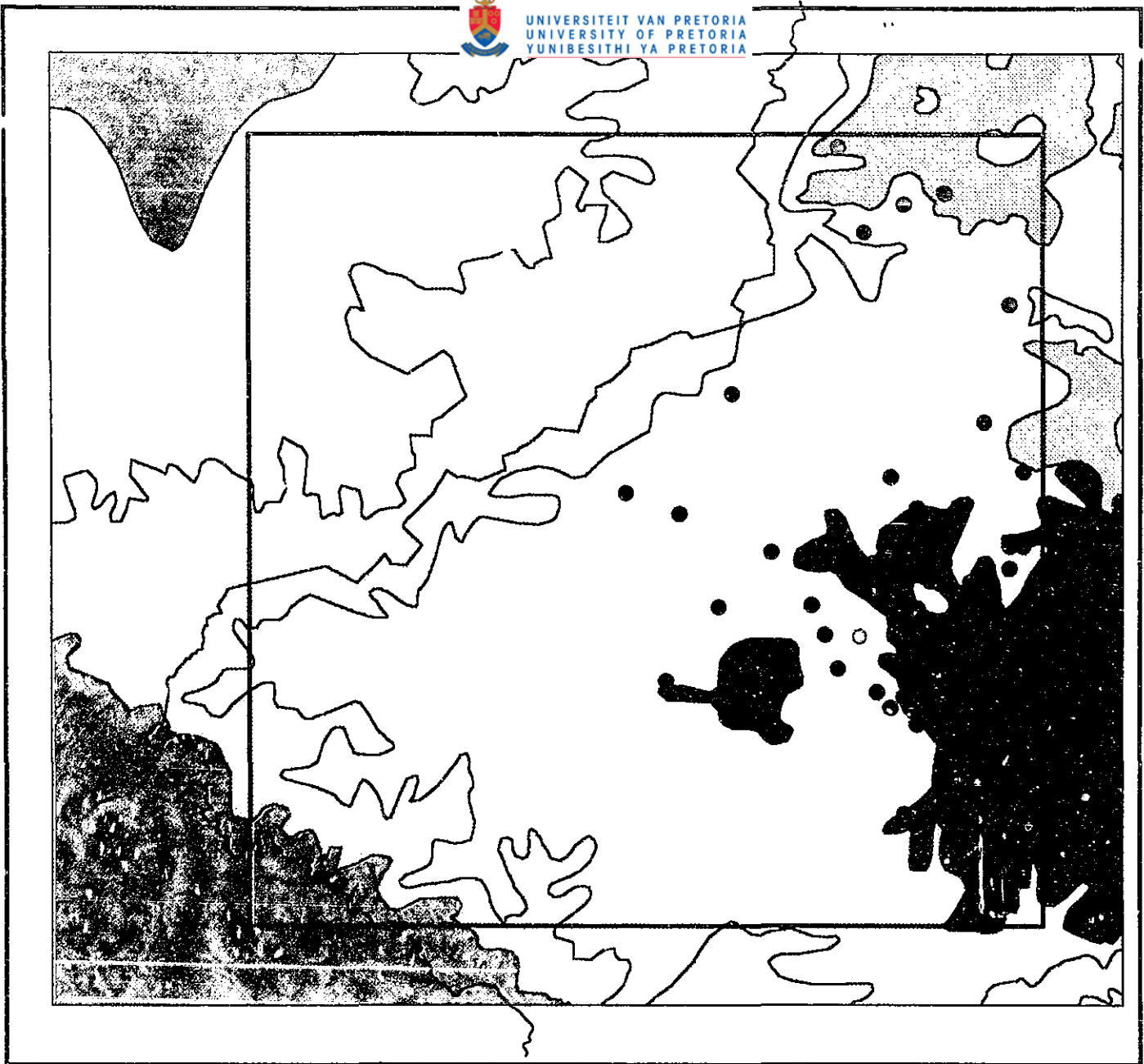
## **7.2 The *Maytenus heterophylla* - *Rhus pentheri* community**

The Two Way Indicator Species Analysis (TWINSPAN) (Hill 1979) separated this woodland community from the *Maytenus heterophylla* - *Acalypha angustata* community. Classification of the relevés by means of TWINSPAN and subsequent refinement by Braun-Blanquet procedures resulted in the recognition of the following sub-communities, variations and sub-variations (Table 7.2):

- 7.2.1 The *Acacia karroo* - *Acacia nilotica* sub-community
  - 7.2.1.1 The *Panicum maximum* - *Bothriochloa insculpta* variation
  - 7.2.1.2 The *Eragrostis superba* - *Sporobolus pyramidalis* variation
    - 7.2.1.2.1 The *Buddleya loricata* - *Aloe marlothii* sub-variation
    - 7.2.1.2.2 The *Vepris lanceolata* - *Ziziphus mucronata* sub-variation
    - 7.2.1.2.3 The *Euclea natalensis* - *Hyparrhenia hirta* sub-variation
    - 7.2.1.2.4 The *Eragrostis superba* - *Aristida congesta* ssp. *barbicollis* sub-variation
    - 7.2.1.2.5 The *Acacia karroo* - *Heteropogon contortus* sub-variation
- 7.2.2 The *Rhus dentata* - *Paspalum dilatatum* sub-community
  - 7.2.2.1 The *Acacia sieberiana* - *Bidens pilosa* variation
  - 7.2.2.2 The *Cephalanthus natalensis* - *Diospyros lycioides* variation

Sample plots of this community are found mainly in the Valley Bushveld (#23), described by Acocks (1988) as the vegetation found in the valleys of numerous rivers draining into the Indian Ocean (Figure 7.7). These valleys are hot and receive less rain than the intervening ridges, from 500 to 900 mm per annum. It is described by Low and Rebelo (1996) as Valley Thickets (Lubke 1996) (#5), vegetation with a closed canopy of

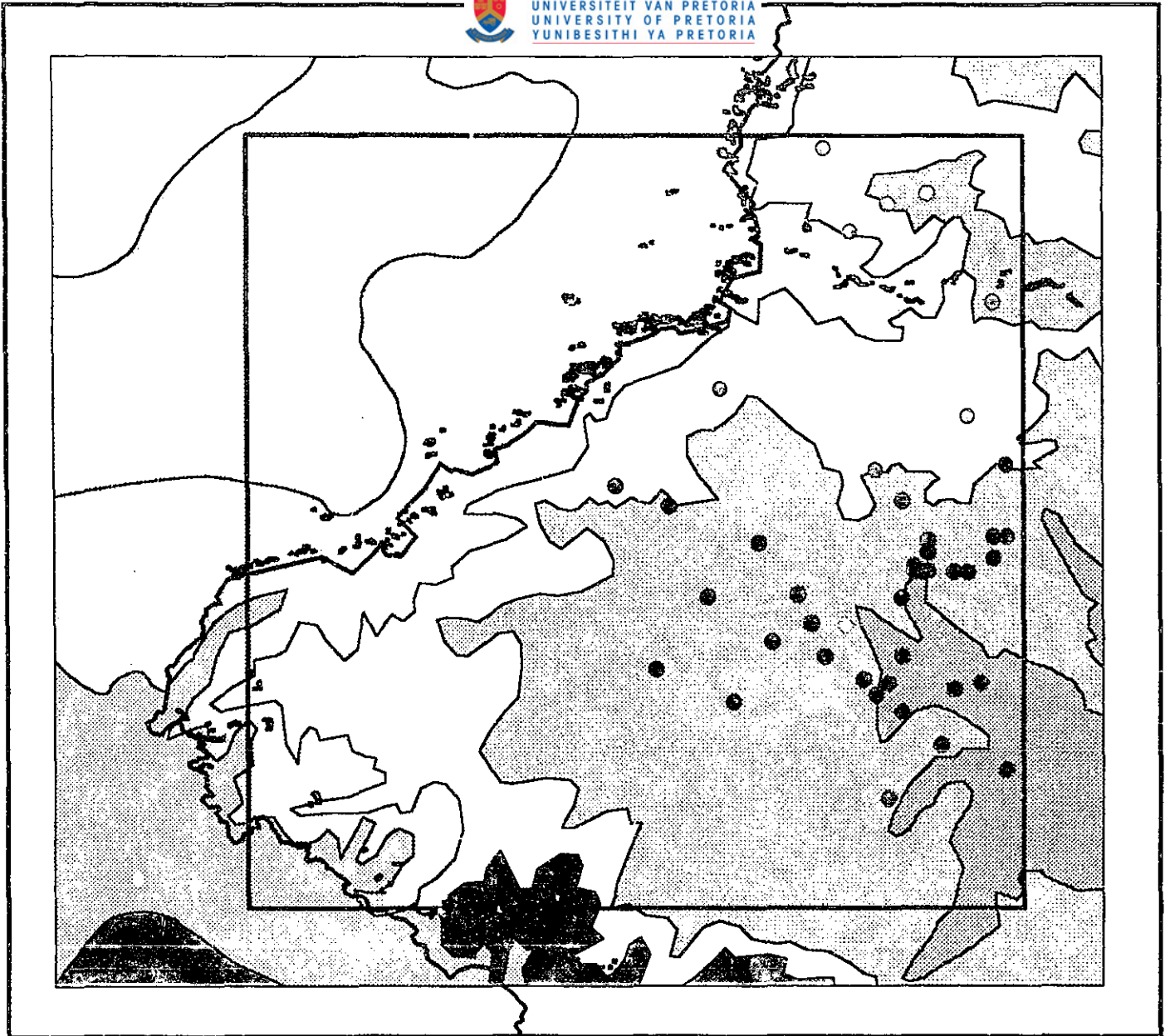




- Ladysmith
  - Gridlines 28° - 29°S and 29° - 30°E
  - ▤ KwaZulu-Natal Boundary
  - Sample plots of the *Maytenus heterophylla* - *Rhus pentheri* community
- Acocks Veld Types**
- ▨ Cymbopogon - Themeda Veld (Sandy) (#48)
  - Highland Sourveld and Dohne Sourveld (#44)
  - Highland Sourveld to Cymbopogon - Themeda Transition (Eastern Free State Highveld) (#49)
  - ▨ Natal Sour Sandveld (#66)
  - Southern Tall Grassveld (#65)
  - ▨ Themeda Veld to Cymbopogon - Themeda Veld Transition (Patchy) (#53)
  - Themeda - Festuca Alpine Veld (#58)
  - ▨ Valley Bushveld (#23)



**Figure 7.7: Distribution of the *Maytenus heterophylla* - *Rhus pentheri* community sample plots in Acocks Veld Types of the study area.**



- Ladysmith
  - Gridlines 28° - 29°S and 29° - 30°E
  - ▤ KwaZulu-Natal Boundary
  - Sample plots of the *Maytenus heterophylla* - *Rhus pentheri* community
- Low and Rebelo Vegetation Types**
- Afromontane Forest (#2)
  - ▨ Valley Thickets (#5)
  - ▩ Natal Central Bushveld (#25)
  - Moist Cool Highveld Grassland (#39)
  - Moist Cold Highveld Grassland (#40)
  - Wet Cold Highveld Grassland (#41)
  - ▨ Moist Upland Grassland (#42)
  - North-eastern Mountain Grassland (#43)
  - ▨ Afro Mountain Grassland (#45)
  - ▩ Alti Mountain Grassland (#46)



**Figure 7.8: Distribution of the *Maytenus heterophylla* - *Rhus pentheri* community sample plots in Low and Rebelo Vegetation Types of the study area.**

up to 6 m in height, dominated by woody, species (Figure 7.8). A great diversity of species is found in this thicket.

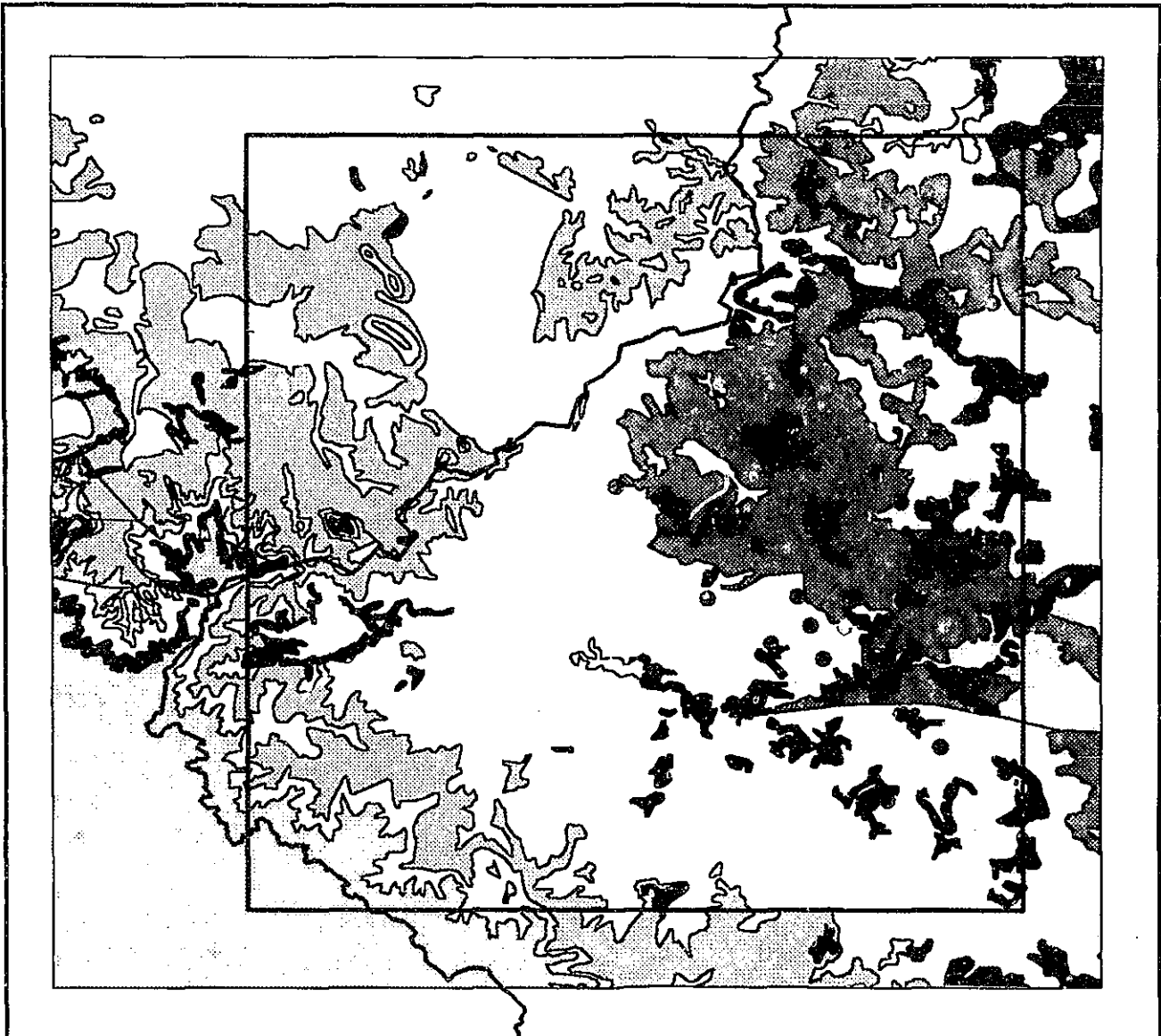
Sample plots representing this community are mostly located on crests, slopes and footslopes of rocky hills. Rockiness is characteristic of the habitat, with rock size in the order of 500 mm diameter, and a cover of 40 - 50%. The soil form in this community is mostly the Mispah form (Orthic A, hard rock) (Macvicar *et. al.* 1977). Where sample plots are located on the footslopes, less rocks are present, but soils are generally shallow and sandy.

General species for the area are listed under Species groups A and P (Table 7.2). These species include the grasses *Themeda triandra*, *Cymbopogon excavatus*, *Melinis repens*, *Heteropogon contortus*, *Setaria sphacelata* and *Eragrostis chloromelas* (Species group P). Woody species include *Acacia karroo*, *Maytenus heterophylla*, *Rhus pentheri* (Species group A), *Rhus dentata*, *Diospyros lycioides* and the liana *Rhoiscissus tridentata*. The forbs *Zinnia peruviana*, *Lantana rugosa*, *Lippia javanica*, *Vernonia capensis*, *Schkuhria pinnata*, *Cyphostemma lanigerum* and *Chamaecrista comosa* (Species group P) are present in this community. A conspicuous species that is present on most hill slopes is the succulent woody species *Aloe marlothii* (Species group P), giving a characteristic physiognomy that is easily recognised in this community.

The geology comprises of Karoo Dolerite, present as rocky hills in the study area (Figure 7.9). The texture of dolerite varies considerably. Most of it is fine- to medium grained, but coarse-grained types are also found.

According to the Climate Zone Map supplied by The Institute for Soil, Climate and Water (1994), the sample plots representing this community occur mainly in climate zone 386. The average annual rainfall is 644.8 mm per annum, peaking during the months of December and January with more than 200 mm, occurring mainly in the form of thundershowers.





- Ladysmith
  - Gridlines 28° - 29°S and 29° - 30°E
  - ▤ KwaZulu-Natal Boundary
  - Sample plots of the *Maytenus heterophylla* - *Rhus pentheri* community
- Geological Formations

- Beaufort
- Clarens
- Drakensberg
- Karoo
- Karoo Dolerite
- Molteno
- ▨ Tarkastad
- ▨ Volksrust
- Vryheid



**Figure 7.9:** Distribution of the *Maytenus heterophylla* - *Rhus pentheri* community sample plots in geological formations of the study area.

An average maximum temperature of 31.2°C is reached in January and an average minimum temperature of 0.8°C during June and July. As a result of the low rainfall, slope and rockiness, the vegetation of these sub-communities and variations are not always suitable for grazing. However, a high degree of utilisation is noted. This high grazing intensity is reflected in the presence of unpalatable grass species such as *Bothriochloa insculpta* (Species group L), *Cymbopogon excavatus* and *Melinis repens* (Species group P), outweighing the palatable grass *Themeda triandra* (Species group P).

The presence of many forbs in the herbaceous layer is also an indication of over-utilisation and degradation. This poor veld condition is associated with a strong woody component, possibly indicating bush encroachment.

#### **7.2.1 The *Acacia karroo* - *Acacia nilotica* sub-community**

This sub-community occurs on the crests, slopes and footslopes of rocky hills in the southeastern and central parts of the study area.

The landscape where this sub-community occurs is characterised by high hills incised with deep valleys in the south-east and undulating plains with interspersed rocky hills to the west. Altitude ranges from 900 to 1 200 m a.m.s.l. Trees cover these hills and the ground layer consists mainly of forbs, though the plains are dominated by grass species. The tree *Acacia nilotica* (Species group B) is diagnostic for this sub-community (Table 7.2).

Other prominent species include the trees *Rhus pentheri* (Species group A), *Acacia karroo*, *Maytenus heterophylla* and *Aloe marlothii* (Species group P) the grasses *Bothriochloa insculpta* (Species group L), *Themeda triandra*, *Cymbopogon excavatus* and *Melinis repens* (Species Group P). Two variations are recognised in this sub-community.

#### **7.2.1.1 The *Panicum maximum* - *Bothriochloa insculpta* variation**

Sample plots of this variation occur on slopes of rocky hills in the Valley Bushveld (#23) (Acocks 1988) or the Valley Thickets (#5), as described by Lubke (1996), at altitudes of less than 1 200 m a.m.s.l. Sample plots are located in the central eastern part of the study area and is geographically separated from the *Eragrostis superba* - *Sporobolus pyramidalis* variation. Utilisation varies and the vegetation appears disturbed, this is noted in the prominence of forbs in the herbaceous layer. Erosion was also noted in some areas. In adjacent areas where grazing was noticeably moderate, the grass layer is in good condition. Rock sizes of up to 1 000 mm diameter, with an average rock cover of 45% were observed.

This variation is present in the 386 climate zone (Institute for Soil, Climate and Water 1994). This is a dry zone with an average rainfall of only 644.8 mm per annum. Species group B characterises this variation, with the grasses *Panicum maximum* and *Sporobolus fimbriatus*, the forbs *Cheilanthes quadripinr.ata*, *Phyllanthus burchellii*, *Bidens formosa* and *Ipomoea obscura* and the tree *Acacia robusta* (Table 7.2). This variation is distinguished from other variations by the absence of species groups D, E, F, H, I, J, K, M, N and O.

Prominent grass species in this variation include *Panicum maximum*, *Sporobolus fimbriatus* (Species group C), *Bothriochloa insculpta* (Species group L) and *Themeda triandra* (Species group P). The forbs *Tagetes minuta* (Species group L), *Zinnia peruviana* and *Lippia javanica* (Species group P) and the trees *Maytenus heterophylla*, *Rhus pentheri* (Species group A), *Acacia karroo*, *Diospyros lycioides* and *Euclea crispa* (Species group P) have high cover abundance values.

#### **7.2.1.2 The *Eragrostis superba* - *Sporobolus pyramidalis* variation**

This variation is found on crests and footslopes of rocky hills in the Valley Bushveld (#23), described by Acocks (1988) and the Natal Central Bushveld (Granger 1996) (#25) and Valley Thickets (#5) (Lubke 1996) in the southeastern and central part of the study

area. On the slopes and crests of hills, rock cover is between 31 and 60% of the soil surface, with sizes between 500 and 1 000 mm diameter. The soil form present in these areas is mostly the Mispah form (Macvicar et. al. 1977). On the footslopes however, rocks are absent. The geology of the area is represented by the Karoo Dolerite geological formation.

Utilisation varies in the different sub-variations, but is generally high, as indicated by the presence of species that are indicative of poor veld conditions. The presence of shallow and, in some cases, duplex soils on the footslopes is problematic in the sense that erosion can become a serious problem. Various climate zones are represented, including 386 and 374, with an average rainfall of 644.8 and 720 mm per annum respectively (Institute for Soil, Water and Climate 1994). Low rainfall, rockiness, presence of poor soils and heavy utilisation are detrimental to the veld.

Species group D is characteristic of this variation and includes the grasses *Sporobolus pyramidalis* and *Eragrostis superba*, the creeper *Clematis brachiata* and the tree *Ehretia rigida*. The *Eragrostis superba* - *Sporobolus pyramidalis* variation is further distinguished by the absence of species groups C, J and K. The geographical position of the sample plots is important for the general physiognomy of the sub-variations. Sample plots situated to the east are inclined to be dominated by tree species, together with grass species usually associated with dry conditions, while sample plots at slightly higher altitudes located to the centre of the study area, are likely to be a more open savanna. Five sub-variations are recognised in this variation.

#### **7.2.1.2.1 The *Buddleya loricata* - *Aloe marlothii* sub-variation**

Occurring in the Natal Central Bushveld (Granger 1996) (#25) at altitudes of more than 1 000 m, it is described as an open savanna with various *Acacia* species. Sample plots representing this sub-variation are located on slopes and footslopes of hills in the central part of the study area. It has been grazed intensively and this is noted in the occurrence of unpalatable grass species, such as *Sporobolus pyramidalis* (Species group D) and

*Cymbopogon excavatus* (Species group P). Various woody species present include *Acacia nilotica* (Species group B), *Acacia karroo*, *Rhus pentheri* (Species group A), *Ziziphus mucronata* (Species group O), *Maytenus heterophylla* and *Aloe marlothii* (Species group P).

The absence of rocks is beneficial to veld condition and this is noted in the absence of *Bothriochloa insculpta* (Species group L). This is an unpalatable grass species that can colonise disturbed areas (Van Oudtshoorn 1991). Species group E characterises this sub-variation and the absence of species groups F, H, I, M and N (Table 7.2) distinguishes it from the other sub-variations. According to Low and Rebelo (1996), soils are shallow, derived from shales and mudstone and are characterised by subsoil, which are either duplex or dominated by black clays, hence the presence of *Acacia nilotica* (Species group A) and *Acacia karroo* (Species group P).

#### **7.2.1.2.2 The *Vepris lanceolata* - *Ziziphus mucronata* sub-variation**

This sub-variation is located in the area of Monte Cristo in the southeastern part of the study area. Located in the 386 climate zone with an average rainfall of 644.8 mm per annum, with warm temperatures on slopes and footslopes of hills that have been moderately utilised. This sub-variation is rich in species.

The *Vepris lanceolata* - *Ziziphus mucronata* sub-variation is characterised by species group F, consisting of species usually found in the Valley Thickets (#5), described by Lubke (1996). This vegetation consists of a great diversity of evergreen woody species, forming a closed canopy of up to 6 m in height. It is distinguished from other sub-variations in the *Eragrostis superba* - *Sporobolus pyramidalis* variation by the absence of species groups E, H and M (Table 7.2).

Prominent species in this sub-variation include the grasses *Eragrostis superba* (Species group D), *Bothriochloa insculpta* (Species group L), *Hyparrhenia hirta* (Species group N), *Themeda triandra*, *Cymbopogon excavatus* and *Setaria sphacelata* (Species group P).

The forbs *Hypoestis forskaolii* (Species group G), *Rhoicissus tridentata* and *Zinnia peruviana* (Species group P) is also prominent. The woody species of species group F as well as *Euclea natalensis* (Species group H), *Maytenus heterophylla*, *Acacia karroo*, *Rhus pentheri* (Species group A), *Ziziphus mucronata*, *Acacia caffra*, *Clerodendrum glabrum* (Species group O), *Aloe marlothii*, *Diospyros lycioides* and *Euclea crispa* (Species group P) have high cover values in this sub-variation.

The location of this sub-variation in the Valley Bushveld (Acocks 1988) (#23), together with a high degree of rockiness (45%) on the hill slopes cause the soil to be shallow and prone to erosion. The high percentage of dominant woody species contributes to a low grazing potential in this sub-variation.

#### **7.2.1.2.3 The *Euclea natalensis* - *Hyparrhenia hirta* sub-variation**

No characteristic species group is recognised in this sub-variation, but it is distinguished from the other sub-variations by the presence of species group H and the absence of E, F, G and I (Table 7.2). Various unpalatable grass species were noted, for example *Sporobolus pyramidalis* (Species group D), *Bothriochloa insculpta* (Species group L), *Cymbopogon excavatus*, *Melinis repens* and *Eragrostis chloromelas* (Species group P). The presence of these unpalatable species might be an indication of moderate utilisation. According to Granger (1996), this sub-variation represents the Natal Central Bushveld (#25) where highly erodible, shallow, duplex soils require careful management. The woody species *Maytenus heterophylla*, *Acacia karroo* (Species group A), *Euclea natalensis* (Species group H), *Rhus rigida* (Species group M), *Aloe marlothii* and *Diospyros lycioides* (Species group P) are also prominent.

A high percentage of rock cover is present (50%) on slopes of hills where this sub-variation occurs. The soils are shallow and large rocks, in the order of 500 mm diameter, are present. Sample plots representing this sub-variation occur in areas where the Natal Central Bushveld (Granger 1996) (#25) merges into the Valley Thickets (Lubke 1996) (#5) in the central part of the study area.

#### 7.2.1.2.4 The *Aristida congesta* ssp *barbicollis* - *Eragrostis superba* sub-variation

This sub-variation is found on the footslopes of hills that have been severely utilised. Evidence of intensive grazing is noted in the high cover of unpalatable grass species such as *Sporobolus pyramidalis* (Species group D), *Bothriochloa insculpta* (Species group L), *Aristida congesta* ssp. *barbicollis* (Species group N), *Cymbopogon excavatus* and *Melinis repens* (Species group P). This sub-variation is characterised by species group I (Table 7.2). Prominent grass species include *Sporobolus pyramidalis*, *Eragrostis superba* (Species group D), *Bothriochloa insculpta* (Species group L), *Hyparrhenia hirta*, *Aristida congesta* ssp. *barbicollis* (Species group N), *Themeda triandra*, *Cymbopogon excavatus* and *Melinis repens* (Species group P). The woody species *Acacia karroo*, *Maytenus heterophylla* (Species group A) and the forbs *Felicia muricata* (Species group M), *Chaetacanthus costatus* (Species group N) and *Lantana rugosa* (Species group P) have high cover values in this sub-variation.

Tree density is low as a result of the low rock cover and subsequently deeper soils. This sub-variation represents the Natal Central Bushveld (#25), described by Granger (1996). The geology conforms to Karoo Dolerite. Various climate zones are represented in this sub-variation.

#### 7.2.1.2.5 The *Acacia karroo* - *Heteropogon contortus* sub-variation

Sample plots representing this sub-variation are found on footslopes of hills with a rock cover of 45%. This sub-variation is widely distributed over various climate zones, geological formations and veld types, but is mostly found in the southeastern part of the study area.

The vegetation of the *Acacia karroo* - *Heteropogon contortus* sub-variation is severely grazed, resulting in the presence of undesirable species, such as *Bothriochloa insculpta* (Species group L), *Sida rhombifolia* (Species group M), *Hermannia depressa* (Species group N), *Cymbopogon excavatus*, *Melinis repens*, *Zinnia peruviana*, *Aloe marlothii* and *Lippia javanica* (Species group P). Species present with high cover abundance include the tree species *Rhus pentheri*, *Acacia karroo*, *Maytenus heterophylla* (Species group A),

*Acacia nilotica* (Species group B) and *Acacia sieberiana* (Species group M). A visible effect of the over-utilisation is bare soil or very little vegetation. A grass species that is conspicuously absent from most sample plots is *Hyparrhenia hirta* (Species group N).

The *Acacia karroo* - *Heteropogon contortus* sub-variation is distinguished from the other sub-variations by the absence of species groups E, F, G, H and I (Table 7.2).

### **7.2.2 The *Rhus dentata* - *Paspalum dilatatum* sub-community**

This sub-community is characterised by species group J and is distinguished from the *Acacia karroo* - *Acacia nilotica* sub-community by the absence of species groups A to H (Table 7.2). It occurs on hills and footslopes of rocky hills in the central-eastern and northern parts of the study area. Average rock size varies between 500 and 1 000 mm diameter and rock cover is more than 35%. The Mispah soil form is predominant. Various climate zones are represented, but rainfall varies between 600 and 900 mm per annum (Institute for Soil, Water and Climate 1994).

Grass species that occur abundantly in this sub-community include *Hyparrhenia hirta*, *Eragrostis plana*, *Sporobolus africanus* (Species group N), *Themeda triandra*, *Cymbopogon excavatus* and *Melinis repens* (Species group P). Prominent forbs include *Solanum elaeagnifolium* (Species group M), *Bidens pilosa* (Species group N), *Zinnia peruviana*, *Aloe marlothii* and *Lantana rugosa* (Species group P). The woody species *Acacia karroo* (Species group A), *Acacia sieberiana* (Species group M) and *Rhus dentata* (Species group P) have high cover values. This sub-community is divided into two variations.

#### **7.2.2.1 The *Acacia sieberiana* - *Bidens pilosa* variation**

The Mispah soil form is predominantly found in this variation. Rocks are present on an average of 31 - 45% and the average size varies between 400 and 1 000 mm diameter. Sample plots of this variation are found on hills and footslopes of rocky hills in the Southern Tall Grassveld (#65) (Acocks 1988). As a result of the wide distribution of the



sample plots, this variation is not confined to one climate zone or geological formation and is distributed over the eastern, central and northern parts of the study area.

No diagnostic species group is recognised for this variation, but it is distinguished from the *Cephalanthus natalensis* - *Diospyros lycioides* variation due to the absence of species group K and the presence of species group L (Table 7.2). The tree *Rhus pentheri* (Species group A), the grass *Bothriochloa insculpta* and the forb *Tagetes minuta* (Species group L) have high cover abundance values in this variation. Mixtures of palatable and unpalatable species occur in this community, indicating grazing pressure, but good potential exists with proper management. The high cover of *Acacia karroo* (Species group A) and *Acacia sieberiana* (Species group M) seedlings indicates bush encroachment.

Palatable grass species include *Hyparrhenia hirta* (Species group N), *Them. di. triandra* and *Setaria sphacelata* (Species group P). Unpalatable grass species with a high percentage cover include *Bothriochloa insculpta* (Species group L), *Aristida congesta* ssp. *barbicollis*, *Eragrostis plana* (Species group N), *Melinis repens* and *Cymbopogon excavatus* (Species group P). Other prominent species include the forbs *Tagetes minuta* (Species group L), *Solanum elaeagnifolium* (Species group M), *Lantana rugosa*, *Zinnia peruviana* (Species group P), the woody succulent *Aloe marlothii* and trees *Maytenus heterophylla*, *Rhus pentheri* (Species group A), *Acacia sieberiana* (Species group L), and *Rhus dentata* (Species group O).

#### **7.2.2.2 The *Cephalanthus natalensis* - *Diospyros lycioides* variation**

Species group K characterises this variation from the *Acacia sieberiana* - *Bidens pilosa* variation as well as the absence of species group L (Table 7.2). Physiognomically this variation is different from the previous because of a less prominent woody component and stronger developed herbaceous layer. It is also different from the previous variation due to a high cover of *Hyparrhenia hirta* (Species group N), *Themeda triandra* and *Cymbopogon excavatus* (Species group P) as well as the presence of the woody species

*Rhus dentata* and *Diospyros lycioides* (Species group P).

This variation occurs on crests and slopes of rocky hills that have been grazed moderately to severely. The distribution of the sample plots stretches through several climate zones, geological formations and veldtypes. Rainfall varies between 600 and 900 mm per annum. Rocks are prominent in this community and the size varies between 200 - 1 000 mm diameter with an average cover between 31 and 60%. The slope varies according to terrain unit between 5° and 25°.