

# A checklist of Pteridophyta of the north-eastern Orange Free State

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## ABSTRACT

A checklist of Pteridophyta recorded within a defined area of the north-eastern Orange Free State is presented. The geology, climate and vegetation of this area are discussed in brief.

## INTRODUCTION

The 63 species of pteridophytes mentioned in this checklist occur in an area within the north-eastern Orange Free State. The area comprises the following quarter degree square grids:

2828 (Bethlehem): –AD, –BC, –CB, –DA, –DB;

2829 (Harrismith): –AA, –AB, –AC, –AD, –BA, –BB, –BC, –CA.

A single voucher specimen is cited for each quarter degree square in which the respective species has been recorded to date. All the cited vouchers are currently housed in the Drakensberg National Botanic Garden Herbarium, unless otherwise stated.

## TOPOGRAPHY AND GEOLOGY

The study area borders on Natal and Lesotho. To the south of it lies Lesotho which forms the watershed between the Orange and Vaal River systems and the eastern escarpment which forms the watershed between the Vaal and Tugela River systems of Natal.

Included in the area are the steep mountainous parts with the highest point at c. 3 281 m near Montaux-Sources. Although the elevation of most of the area is much lower (c. 1 500–1 700 m) the topography is much dissected along the foothills of the high Drakensberg and the Natal border. Further inland the topography is less dissected but a few prominent outliers such as Platberg (2 394 m), Bakerskop (2 037 m) and Rensburgkop (2 235 m) arise almost directly from the surrounding almost flat landscape. King (1982) suggested that these steep-sided residuals of the Clarens Formation and black Drakensberg basalt, occurring largely along the present-day escarpment, already formed a watershed in Early Cenozoic time.

As in the High Drakensberg, most of the higher outliers are overlain by basaltic lava to a thickness of c. 914 m which forms a steep upper catchment of well grassed hills and valleys. The geology of the area and surroundings has been mapped and described by Van Eeden (1937), Visser (1955), Killick (1963), Van der Eyck (1967), Spies (1969) and King (l.c.).

## CLIMATE

The climate within the region can be described as temperate during the summer months but severe during the winter. Temperatures fluctuate considerably and are influenced by factors such as topography, altitude and wind. During the summer (October–March) day temperatures may reach 30°C while the night temperatures may often reach a maximum of 13°C. Winter temperatures are more severe and the day temperatures frequently do not reach the 15°C mark. On many occasions the maximum temperature barely reaches 5°C. Night temperatures may drop as low as –15°C. It can be accepted that at higher elevations the temperature may be considerably lower and that frost is an almost daily occurrence during the months April to August.

The predominant winds blow either from the west or the east. The westerly winds may often reach gale force during the period August to September and regularly cause dust storms. These winds are dry and warm, whereas the easterly winds usually cause a considerable, usually rapid, drop in temperature along the escarpment and higher-lying areas.

Rain usually falls either in the form of gentle soaking rain or severe thunderstorms, often associated with hail. The main rainy season is from September to March. The average precipitation at Harrismith is about 777 mm per annum while at Phuthaditjhaba (Witsieshoek) it is 811 mm per annum (Weather Bureau, 1965). At higher elevations the precipitation can exceed 1 000 mm (Killick 1978). Here snowfalls are experienced annually between the period July to September; lower-lying areas experience only sporadic snowfalls.

## VEGETATION

Acocks (1975), recognized three major vegetation types within the study area. Highveld Sourveld (no. 44) occupies the lower-lying areas whereas the Highveld Sourveld to *Cymbopogon–Themeda* Veld Transition (no. 56) occurs along the Natal escarpment. *Themeda–Festuca* Alpine Veld (no. 58) is largely confined to the High Drakensberg along the Lesotho border.

Published works on the vegetation of the north-eastern Free State and surroundings are limited to species lists of the Golden Gate Highlands National Park by Roberts (1969), Markötter's (1930) compilation of Thode's plant collections between 1891 and

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1914 at Phuthaditjhaba (Witsieshoek), Oliviershoek Pass and Koolhoek, and a plantsociological study on the pioneer vegetation in the north-eastern Free State carried out by Stam (1973).

Vegetation surveys of the higher lying regions of the Natal Drakensberg bordering on the study area were carried out by Staples & Hudson (1938), Killick (1963) and Edwards (1967).

Most of the area is covered by grassland. The deep valleys and protected gorges at lower elevations, especially on the moist eastern slopes, are forested and are mostly dominated by *Leucosidea sericea* and mixed *Leucosidea-Buddleja* scrub forest. The more sheltered forests are dominated by *Podocarpus latifolius* (Thunb.) R. Br. ex Mirb.

The abundance of bulbous plants together with the fire-resistance of most plants occurring in the grassveld areas suggest that fire has been an important factor since very early times (Bayer 1955).

### UITTREKSEL

'n Kontrolelys van Pteridophyta, wat binne 'n om-skrewe gebied in die noordoostelike Oranje-Vrystaat waargeneem is, word gegee. Die geologie, klimaat en plantegroei van die gebied word kortliks bespreek.

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### CHECKLIST

#### LYCOPODIACEAE

- Lycopodium* L.  
*clavatum* L. 2829 (Harrismith): (-AD), Roux 846; (-CA), Roux 1078.  
*saururus* Lam. 2829 (Harrismith): (-AC), Roux 987; (-AD), Roux 852; (-CA), Roux 1283.  
*verticillatum* L.f. 2829 (Harrismith): (-CA), Roux 836.

#### SELAGINELLACEAE

- Selaginella* Beauv.  
*cafferorum* (Milde) Hieron. 2828 (Bethlehem): (-DA), Roux 1014. 2829 (Harrismith): (-AC), Roux 1549; (-CA), Roux 879; (-CB), Roux 928.  
*imbricata* (Forssk.) Spring ex Decne. 2828 (Bethlehem): (-DA), Roux 1030; (-DB), Roux 906.  
*mittenii* Bak. 2829 (Harrismith): (-AC), Roux 868; (-AD), Roux 884.

#### ISOETACEAE

- Isoetes* L.  
*transvaalensis* Jermy & Schelpe 2828 (Bethlehem): (-DB), Roux 955. 2829 (Harrismith): (-AC), Roux 1277.

#### EQUISETACEAE

- Equisetum* L.  
*ramosissimum* Desf. 2828 (Bethlehem): (-DA), Roux 1023. 2829 (Harrismith): (-AC), Roux 1551.

#### OPHIOGLOSSACEAE

- Ophioglossum* L.  
*lancifolium* Presl 2828 (Bethlehem): (-DB), Roux 954.  
*polyphyllum* A. Br. 2828 (Bethlehem): (-BC), Roux 939; (-BD), Roux 950. 2829 (Harrismith): (-AA), Roux 1035; (-AC), Van der Zeyde s.n.; (-AD), Roux 1060.

#### OSMUNDACEAE

- Osmunda* L.  
*regalis* L. 2829 (Harrismith): (-CA), Roux 1285.

#### SCHIZAEACEAE

- Mohria* Swartz  
*cafferorum* (L.) Desv. 2828 (Bethlehem): (-BC), Roux 947; (-DB), Roux 912. 2829 (Harrismith): (-AA), Roux 1501; (-AC), Roux 807; (-AD), Roux 861.  
*hirsuta* J.P. Roux 2828 (Bethlehem): (-DB), Roux 1214. 2829 (Harrismith): (-CA), Roux 1068.

#### GLEICHENIACEAE

- Gleichenia* J.E. Sm.  
*polypodioides* (L.) J.E. Sm. 2829 (Harrismith): (-AA), Roux 1505; (-CA), Roux 1073.

#### CYATHEACEAE

- Cyathea* J.E. Sm.  
*dregei* Kunze 2829 (Harrismith): (-AD), Roux 862; (-CA), Roux 1287.

#### HYMENOPHYLLACEAE

- Trichomanes* L.  
*pyxidiferum* var. *melanotrichum* (Schlechtld.) Schelpe 2829 (Harrismith): (-AD), Roux 886.  
*Hymenophyllum* J.E. Sm.  
*tunbridgense* (L.) J.E. Sm. 2829 (Harrismith): (-AC), Roux 986; (-AD), Roux 851.

#### MARSILEACEAE

- Marsilea* L.  
*burchellii* (Kunze) A. Br. 2829 (Harrismith): (-AC), Roux 989.  
*macrocarpa* Presl 2829 (Harrismith): (-AC), Jacobz 4719.

#### DENNSTAEDTIACEAE

- Pteridium* Gled. ex Scop.  
*aquilinum* (L.) Kuhn subsp. *aquilinum* 2829 (Harrismith): (-AC), Roux 1530; (-CA), Roux 1284.

#### ADIANTACEAE/PTERIDACEAE

- Pityrogramma* Link  
*calomelanos* (Swartz) Link var. *aureoflava* (Hook.) Weath. ex Bailey 2829 (Harrismith): (-AC), Roux 1280.

**Anogramma Link**

leptophylla (L.) Link 2829 (Harrismith): (–AC), Roux 1074.

**Adiantum L.**

capillus-veneris L. 2828 (Bethlehem): (–BC), Roux 935; (–DA), Roux 1029. 2829 (Harrismith): (–AC), Roux 1547; (–CA), Roux 837.  
poiretii Wikstr. 2829 (Harrismith): (–AC), Roux 1543; (–CA), Roux 1526.

**Pteris L.**

cretica L. 2828 (Bethlehem): (–DA), Roux 1027. 2829 (Harrismith): (–CA), Roux 1527.

**Cheilanthes Swartz**

capensis (Thunb.) Swartz 2829 (Harrismith): (–AC), Roux 927.

eckloniana (Kunze) Mett. 2828 (Bethlehem): (–BC), Roux 940; (–BD), Roux 951; (–DA), Roux 1015; (–DB), Roux 920. 2829 (Harrismith): (–AC), Van der Zeyde s.n.

hirta Swartz 2828 (Bethlehem): (–BC), Roux 933; (–DA), Roux 1016. 2829 (Harrismith): (–AC), Roux 795; (–CA), Roux 1525.

multifida (Swartz) Swartz 2829 (Harrismith): (–AC), Roux 822.

quadrifida (Forssk.) Kuhn 2828 (Bethlehem): (–BC), Roux 932; (–DA), Roux 1018. 2829 (Harrismith): (–AC), Roux 812.

viridis (Forssk.) Swartz var. viridis 2829 (Harrismith): (–AC), Van der Zeyde s.n.

viridis var. glauca (Sim) Schelpe & N.C. Anthony 2828 (Bethlehem): (–DA), Roux 1020; (–DB), Roux 1236. 2829 (Harrismith): (–AC), Roux 863.

**Pellaea Link**

calomelanos (Swartz) Link 2828 (Bethlehem): (–DA), Roux 1017. 2829 (Harrismith): (–AC), Roux 869; (–CA), Van der Zeyde s.n.

**POLYPODIACEAE****Polypodium L.**

polypodioides (L.) Hitchc. subsp. ecklonii (Kunze) Schelpe 2829 (Harrismith): (–CA), Roux 878.

vulgare L. 2829 (Harrismith): (–AC), Roux 820; (–AD), Roux 890.

**Pleopeltis H.B.K. ex Willd.**

macrocarpa (Bory ex Willd.) Kaulf. 2828 (Bethlehem): (–BC), Roux 946; (–DA), Roux 1025. 2829 (Harrismith): (–AC), Jacobz 4716.

schraderi (Mett.) Tardieu 2828 (Bethlehem): (–DA), Roux 1024. 2829 (Harrismith): (–AA), Roux 1506; (–AC), Roux 821; (–DA), Roux 853.

**ASPLENIACEAE****Asplenium L.**

adiantum-nigrum L. 2828 (Bethlehem): (–BC), Roux 929; (–DA), Roux 1028. 2829 (Harrismith): (–AC), Roux 797.

aethiopicum (Burm. f.) Becherer 2828 (Bethlehem): (–BD), Roux 952; (–DB), Roux 918; 2829 (Harrismith): (–AC), Roux 1545; (–AD), Roux 854; (–CA), Roux 829.

monanthes L. 2829 (Harrismith): (–AC), Roux 796; (–CA), Roux 877.

platyneuron (L.) Oakes 2828 (Bethlehem): (–BC), Roux 930. 2829 (Harrismith): (–AC), Roux 785; (–AD), Roux 860.

splendens Kunze subsp. drakensbergense Braithwaite 2828 (Bethlehem): (–DB), Roux 1532. 2829 (Harrismith): (–AC), Roux 921.

stoloniferum Bory 2828 (Bethlehem): (–DA), Roux 1219.

2829 (Harrismith): (–AC), Roux 818; (–CA), Roux 833.

theciferum (H.B.K.) Mett. var. concinnum (Schr.) Schelpe 2829 (Harrismith): (–AD), Roux 889; (–CA), Roux 830.

trichomanes L. 2828 (Bethlehem): (–BC), Roux 934; (–DA), Roux 1026; (–DB), Roux 1683. 2829 (Harrismith): (–AC), Roux 785.

varians Wall. ex Hook. & Grev. subsp. fimbriatum (Kunze) Schelpe 2828 (Bethlehem): (–DA), Roux 1218. 2829 (Harrismith): (–AD), Roux 888; (–CA), Roux 1215.

**Ceterach DC.**

cordatum (Thunb.) Desv. 2828 (Bethlehem): (–BC), Roux 941. 2829 (Harrismith): (–AC), Roux 1554.

**ATHYRIACEAE****Cystopteris Bernh.**

fragilis (L.) Bernh. 2828 (Bethlehem): (–DA), Roux 1019; (–DB), Roux 922. 2829 (Harrismith): (–AC), Roux 1544; (–AD), Roux 855.

**Athyrium Roth**

scandinicum (Willd.) Presl 2829 (Harrismith): (–AC), Roux 1531.

**LOMARIOPSIDACEAE****Elaphoglossum Schott**

acrostichoides (Hook & Grev.) Schelpe 2828 (Bethlehem): (–BC), Roux 936. 2829 (Harrismith): (–AC), Roux 799; (–AD), Roux 847; (–CA), Roux 838.

drakensbergense Schelpe 2828 (Bethlehem): (–DB), Roux 971. 2829 (Harrismith): (–AC), Roux 824.

spathulatum (Bory) T. Moore 2829 (Harrismith): (–AD), Roux 1062; (–CA), Roux 882.

**ASPIDACEAE/DRYOPTERIDACEAE****Woodsia R. Br.**

montevidensis (Spreng.) Hieron. var. burgessiana (Gerr. ex Hook. & Bak.) Schelpe 2828 (Bethlehem): (–DB), Roux 956. 2829 (Harrismith): (–AA), Roux 1503; (–AD), Roux 856.

**Dryopteris Adans.**

dracomontana Schelpe & N.C. Anthony 2828 (Bethlehem): (–DB), Roux 904. 2829 (Harrismith): (–AC), Roux 1040.

pentheri (Krassner) C. Chr. 2828 (Bethlehem): (–DA), Roux 1217. 2829 (Harrismith): (–AC), Roux 1546; (–AD), Roux 1063; (–CA), Roux 875.

**Polystichum Roth**

alticola Schelpe & N.C. Anthony 2829 (Harrismith): (–AC), Roux 782; (–AD), Roux 892; (–CA), Roux 876.

dracomontanum Schelpe & N.C. Anthony 2829 (Harrismith): (–AA), Roux 1502; (–AD), Roux 896.

pungens (Kaulf.) Presl 2829 (Harrismith): (–AC), Roux 987.

luctuosum (Kunze) T. Moore 2828 (Bethlehem): (–DB), Roux 1228. 2829 (Harrismith): (–AC), Roux 987.

transvaalense N.C. Anthony 2828 (Bethlehem): (–BC), Roux 937.

**BLECHNACEAE****Blechnum L.**

giganteum (Kaulf.) Schlecht. 2829 (Harrismith): (–CA), Roux 883.

inflexum (Kunze) Kuhn 2829 (Harrismith): (–AC), Roux 793; (–AD), Roux 859; (–CA), Roux 831.

punctulatum Swartz 2828 (Bethlehem): (–BC), Roux 948. 2829 (Harrismith): (–AA), Roux 1504; (–AC), Roux 1548; (–CA), Roux 827.