The flora of the Brandberg, Namibia

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An updated checklist of almost 490 vascular plants known to occur on the Brandberg Mountain, Namibia, is presented. Taxonomic changes and phytogeographic affinities are indicated. The influences of the physical environment and climate on the diversity of plants are briefly discussed, together with the impact of man and other animals on the botanical structure.
The history of botanical exploration of the mountain and aspects of the vegetation are reviewed.

INTRODUCTION

Numerous collectors have made valuable contributions to the study of the Brandberg flora. As a result, the mountain is considered floristically well known. Despite this, many questions remain unanswered. This is partly due to the fact that collectors are often not present when good specimens are available and collections have often been made during unsuitable periods. Both Nordenstam (1974) and Bruyns (1990) commented on their limited collecting during dry periods or years.

Nordenstam (1974) provides a background to the early botanical exploration of the Brandberg and lists plants recorded by Maack (1923), Walter (1972) and Wiss (1957). He further refers to botanical texts that describe species that occur on the mountain (e.g. Friedrich 1957, Friedrich, M 1961, and Nordenstam 1967). Jacobson (1981) discusses some useful plants and Kinahan (1991) discusses aspects of the vegetation in the Hungorob area, where he was undertaking archaeological work between 1980 and 1984. Walter (1979, 1989) mentions the plants in articles on his climbing expeditions.

The late Harald Pager (*vide* Craven 1986), collected plants in the vicinity of rock shelters, while engaged in the documentation of the Brandberg's rock paintings. Specimens he collected were identified by L. Moisel and later by the first author. Cologne University, who also funded the archaeologist Peter Breunig, funded Pager's major research. Breunig did not engage in the collection of plants, but published three useful papers on temperature, rainfall and archaeobotany (Breunig 1988a, 1988b, 1990).

Bruyns (1990) added a further 16 taxa to the Brandberg list, following three visits to the Brandberg in the 1980s and further described an unusual hybrid from the massif (Bruyns 1988).

Since the beginning of the 1970s, the authors have collected extensively on the mountain and these specimens are now housed in the National Herbarium of Namibia (WIND).

The aim of this contribution is to provide an updated checklist of the vascular plants currently known to occur on the Brandberg Massif, based on and indicating voucher specimens, which can serve as a basic reference for future taxonomic, floristic and ecological research. The Brandberg's position in broader countrywide studies is also indicated.

PHYSICAL ASPECTS OF THE BRANDBERG

Study area

The plants listed in Table 1 and discussed in the text occur from the base of the mountain upwards and in drainage courses at the immediate base. These drainage courses are floristically richer than the surrounding plains, as they benefit from the run-off from the slopes and are, therefore, dependent on the mountain catchment. Plants recorded from the hills in the vicinity and at the Ugab River are excluded.

Geology

The occurrence of granite and basalt on the Brandberg is of great importance to the vegetation, as many of the perennial species are restricted to one or other of these geological formations (*vide* Miller this volume). The increase in plant records is largely due to good collections having been made on the upper basalt layer in the northeast of the Brandberg (near Sonusib). Large areas of the Brandberg are covered by rock plates, which are unable to retain water. These plates are important when discussing vegetation, as run-off from these plates and the microclimates this effects, contributes to increase or decrease in vegetation.

Climate

Precipitation is available to plants in the form of rainfall and mists, due to the close proximity of the Brandberg to the Atlantic Ocean. Run-off water, which collects in cracks or sand patches below granite plates, is another important source of water. Due to the sheltered position afforded by the rock crevices and faces, evaporation is reduced to a minimum, and as a result, water is retained in greater quantities and for longer periods.

Microclimatic conditions also affect plant growth e.g. air temperature above sun-exposed rock plates, may be far in excess of that in the surrounding areas and large granite boulders provide protection from the sun for shade-loving species, protection from prevailing wind and may also act as catchment surfaces for condensation.

THE VEGETATION

Plant communities

Plants occurring together in repeated association i.e. plant communities have not been classified according to any recognised system incorporating environmental features such as climate and substrate. Such a system for a mountain massif is, in fact, yet to be found (B. Strohbach pers. comm.). The influence of factors, such as very localised and variable rainfall and the frequency of droughts, on vegetation, may result in some studies being both unreliable and too contingent.

A short comparative study of plant communities on a south-northerly gradient from the base of the mountain to Königstein has recently been undertaken by M. Wittneben (pers. comm.).

The relationship of the Brandberg within ecological systems on a broader scale i.e. the natural regions of Giess (1971) and the biomes of Irish (1994) are discussed briefly.

Natural vegetation regions

Giess (1971) compiled a preliminary vegetation map of Namibia, in which, the Brandberg is shown to lie within the Semi-desert and Savanna transitional zone. Due to altitudinal variation however, a closer look reveals characteristic of three different zones:

Plants characteristic of the Semi-desert and Savanna transitional zone occur on the lower slopes of the Brandberg and include *Moringa ovalifolia*, *Adenolobus gariepensis* and various species of the genus *Commiphora*. On both the lower and middle slopes one finds *Acacia montis-usti* and *Euphorbia guerichiana* and *Cyphostemma currorii* is to be found on the upper Brandberg. *Acacia senegal* var. *rostata* is confined to the basalt.

Species that characterise the Highland savanna (Bergthorn Savanna) are found on the upper Brandberg e.g. *Acacia hereroensis*, *Euclea undulata*, *Dombeya rotundifolia*, *Rhus marlothii, Ozoroa crassinervia* and *Olea europaea* subsp. *africana.*

At the entrances to gorges, adjacent to the Namib Plains, or in water courses at the base of the massif, species characteristic of the western Riverine Woodland zone occur e.g. *Acacia erioloba*, *Faidherbia albida*, *Combretum imberbe*, *Tamarix usneoides*, *Euclea pseudebenus* and *Salvadora persica.*

Biomes

The Namibian biomes, as defined by Irish (1994) are large land communities distinguished on the basis of dominant plant life forms and on climatic features. According to this classification system, the Brandberg Massif is situated in the Desert Biome, but the southern foothills are within the Nama-Karoo Biome. The upper Brandberg was considered by Irish (1994) to constitute a unique feature in southern Africa, in being a high altitude Savanna Biome outlier.

It is interesting to note, that different approaches to the classification of vegetation may mean more to some studies, than to others. Irish (1994), for example, points out that the biogeographical analysis of some insect groups exhibits a higher degree of correspondence with biome limits, than with other proposed vegetation classifications for Namibia e.g. Giess (1971). This point should be borne in mind when undertaking detailed vegetation surveys of the Brandberg.

THE FLORA

The checklist of higher plants of the Brandberg was compiled as follows:

- by reference to the collections and field notes of the writers, whose voucher specimens are deposited in the National Herbarium of Namibia (WIND)
- by searching the specimen database (SPMNDB) of the National Herbarium which includes Namibian specimens housed in the National Herbarium in Pretoria, South Africa (PRE)
- including taxa based on voucher specimens i.e. taxa cited in literature (e.g. Maarck 1923; Wiss 1957, Kinahan 1991) that were not based on specimens were removed from the list as identification could not be confirmed. These are placed in the Appendix
- consulting the following literature: Bruyns (1990), Craven (1987, 1989), Giess (1982a), Moisel (1982), Nordenstam (1974, 1982), and Wiss (1957)
- selectively adding specimens only labelled 'Brandberg' on the database, e.g. Liebenberg's specimens, as they appear to have been collected at some distance from the Brandberg itself
- examining herbarium specimens in problematical cases

- by indicating voucher specimens (Table 1 and collectors name and number underlined in the text), especially where name changes made on herbarium specimens are not cited in literature
- families and taxa are arranged according to the nomenclature and arrangement of taxa in Craven (1999, 2000 a & b)
- only taxonomic changes of particular relevance to the Brandberg specimens are indicated in the text as name changes, synonyms and taxonomic literature sources can be found in Craven (1999, 2000 a & b)
- indicating zone of occurrence on the Brandberg based on Nordenstam (1974, 1982), Bruyns (1990) as well as the field notes of the writers
- including growth forms of the plants on the Brandberg based on the authors' collections and database and other herbarium records
- distribution of the taxa was obtained from authors' database and literature

The checklist can be summarised as follows:

1. The taxa

A total of 480 species of indigenous vascular plants are recorded from the Brandberg. The increase over previous estimates (e.g. 337 of Nordenstam 1974), is chiefly due to collections having been subsequently made on the northern side of the massif, as well as in the Bushmantal area, which are less accessible to collectors due to the paucity of surface water.
The list of taxa presented here should not be regarded as definitive, as further collections made during years of good rainfall shall undoubtedly produce further records.

Eight naturalised taxa have been recorded thus far from the Brandberg, all of which occur commonly during years of good rain. This number of naturalised taxa is relatively low, as compared to similar habitats elsewhere in Namibia. Increased human access may, unfortunately, result in further introductions.

2 Taxa with distinct altitudinal variations

Moisel (1982) discussed the altitudinal variations of plants in the Orabeswand, but no further evaluation has been undertaken for the Brandberg. Some notable aspects are summarised below:

Plants that range from the base of the Brandberg to the highest areas are limited in number and are small plants which rely on microclimates such as those found beneath boulders e.g. ferns. No tree species occur continuously from the base to the higher altitudes. *Olea europaea* subsp. *africana* is confined to the higher peaks, where it is characteristically a shrub, but at slightly lower elevations, where they occur in run-offs, large cracks or small plains, where more water is available, robust trees are found. The different peaks, although isolated from one another by some distance, have the same species e.g. *Cyathula* sp. nov., *Euphorbia monteiroi* subsp. *brandbergensis, Olea europaea* subsp. *africana,* etc. *Commiphora* species are limited to lower parts of the massif, while *Sterculia africana* is mostly encountered at a lower altitude than *S. quinqueloba.*

Although Moisel (1982) records hairy forms of *Ozoroa crassinervia* from the upper Brandberg and glabrous forms lower down in Orabes, this, however, is not the case in other parts of the upper Brandberg, where both glabrous and hairy forms occur together.

Collections on the basalt plain above the Sonusib gorge, have not only increased the numbers of plants known to occur on the mountain, but also altered views on altitudinal variations. Plants found generally nearer the base on the southern sides are recorded at higher altitudes on the northeastern side.

3. Plant distributions

3.1 Taxa endemic to the Brandberg

The following are restricted to the Brandberg: *Felicia gunillae* (Asteraceae), *Hermannia merxmuelleri* (Sterculiaceae), *Lithops gracilidelineata* subsp. *brandbergensis* (Mesembryanthemaceae), *Nidorella nordenstamii* (Asteraceae), *Pentzia tomentosa* (Asteraceae), *Plumbago wissii* (Plumbaginaceae), and *Ruellia brandbergensis* (Acanthaceae).

Of the seven plants recorded as Brandberg endemics, three have been collected on only one occasion in 1963, this being an exceptionally good rain year. Two, *Felicia gunillae* and *Pentzia tomentosa*, were collected near the summit of the highest peak (Königstein), while the herbaceous *Nidorella nordenstamii* was collected on the western side of Orabeswand in a dry watercourse.

Plumbago wissii has been collected on Königstein and on Aigub (2550m). *Lithops gracilidelineata* subsp. *brandbergensis* occurs from 2300-2400m, being the highest recorded habitat for the genus *Lithops* (Cole 1988). The two commonest endemics are those which also occur at lower altitudes *viz. Ruellia brandbergensis* and *Hermannia merxmuelleri.*

Different botanical life forms are represented among the endemics but the majority, are dwarf shrubs.

No endemic families or genera have been recorded from the Brandberg and the fact that three of these endemic species belong to the Asteraceae is not exceptional, it being the largest botanical family. That Nordenstam, a specialist on the Asteraceae, collected all the type specimens of these three species in a year of abnormally good rain, poses the question, as to whether specialist collecting in favourable conditions would not yield further Brandberg endemics?

Other species still requiring taxonomic review, or have possible Brandberg forms cited by Nordenstam (1974) include: *Cardiospermum pechuelii; Petalidium canescens, Senecio eenii, Striga gesnerioides, Anthephora ramosa, Enneapogon scoparius* and *Stipagrostis hirtigluma* subsp. *pearsonii*, *Dombeya damarana* (as *D. rotundifolia*) and the transitional form of *Pteronia cylindracea.*

The specimen identified as *Cyathula cylindrica* by Nordenstam (1974), is probably the same taxon as that considered to be a new species by Schroeder, who studied the Namibian *Cyathula* genus for *Prodromus eine Flora von Südwestafrika* (Merxmüller (ed).1966-1972). Unfortunately, no taxonomic research is currently being undertaken on the genus, thus Craven 1406, etc. await further study. The species is a dwarf shrub, limited to the highest peaks (Horn, Numas Spitz, Aigub and Königstein) like some of the other Brandberg endemics.

2.2. Taxa endemic to the Brandberg and limited other localities

As predicted by Nordenstam (1974), some of the plant species he listed as Brandberg endemics have subsequently been encountered elsewhere in Namibia. These include *Euphorbia monteiroi* subsp. *brandbergensis*, a common plant of the upper Brandberg, is believed to be the same taxon as that to be found on the Spitzkop (Bruyns 1992; P.V. Bruyns pers. comm.). Similarly, *Hoodia montana*, known from a single collection made in 1935 has been removed from the list of Brandberg endemics, as the species is synonymous with *Hoodia currorii. Mentha wissii* is synonymous with *Mentha longifolia* subsp. *wissii*, being also found in the Naukluft Mountains and possibly also south of the Orange River. Both *Scirpus aciformis* and *S. hystricoides* (Cyperaceae), are synonyms of taxa with more widespread distributions. The former is a synonym of *Isolepis hemiuncialis* and the latter of *Lipocarpha rehmannii.*

Some plants, which occur on the Brandberg, have limited distributions elsewhere in Namibia, and these include:

- *Aloe viridiflora* (Asphodelaceae), from the Auas Mountains and Nauchas koppies in the Rehoboth District.
- *Corchorus merxmulleri* (Tiliaceae), from the Erongo region, especially, Otjihorongo and Ameib areas.
- *Cucumella clavipetiolata* (Cucurbitaceae), known from the Mubib (near Maltahöhe), Gamsberg and Etjo Mountains.
- *Eragrostis aristida* (Poaceae), which may also occurs near the mouth of the Unjab river
- Four Scrophulariaceae taxa are associated with the Brandberg Massif. *Jamesbrittenia chenodioides*, which grows only at the base of mountains on granite or amongst rocks from the Kaokoveld south to the Brandberg. *Jamesbrittenia hereroensis*, which ranges from the Naukluft Mountains to the Brandberg, where it is to be found growing in watercourses and in the vicinity of springs. *Selago lepida*, which appears to be confined to the western Namibian escarpment, from the Brandberg to the Karasberg (Hilliard 1999) and *Manulea dubia* which occurs on mountains and high plateaus e.g. the Brandberg, Waterberg to Great Karasberg (Hilliard 1994).
- *Othonna brandbergensis* and *Osteospermum muricatum* subsp. *longiradiatum* (Asteraceae) also occur on the Gamsberg, the former species having also been recorded further south and may possibly be present on other granite outcrops in the Namib Desert.
- *Nicotiana africana* (Solanaceae) also occurs on the Erongo and Spitzkop Mountains (Giess 1982b; Merxmuller & Buttler 1975). Some people (e.g. Kinahan 1991) believe this to be an introduced species as it is a New World group with no close relatives in Africa and is represented here by a single species. He suggested in his book (p. 84-85) that the plant would have reached this area overland after its introduction to West Africa from the New World in about the 16th century. Cytological and biochemical evidence (Gerstel *et al.* 1979) however suggest that it is not closely related to *Nicotiana tabacum*, but to a possible relationship with an Australian and south Pacific island taxon, and that how it or its ansestors could have reached Africa remain a puzzle. It is not that uncommon in plants to find a single taxon of a specific genus to occur at a great distance from its main area of occurrence or diversity.
- *Peristrophe namibensis* subsp. *brandbergensis* occurs from the Sesfontein area to the Brandberg.
- M*yxopappus acutilobus* is found on the Brandberg and near Rehoboth.

2.3 Taxa endemic to Namibia

87 of the plants occrrring on the Brandberg are found only within the political borders of Namibia. Some of these are widely distributed and common, while others like *Microloma hereroense* (from the Naukluft, Brandberg, Gamsberg and Ozondai areas), and *Tylophora fleckii* (Brandberg, Kaokoveld, Gamsberg, Great Karas and Tiras Mountains) are uncommon and occur in scattered localities.

2.4 Taxa with disjunctions distributions

Diospyros acocksii, a species with distinct features, is known from a limited area in the northern Cape, in the Warmbad district of Namibia and on the Brandberg. It is the only species on the Brandberg with such a distribution pattern, but further study may reveal others. *Commiphora namaensis,* a plant on the plains near the base of the Brandberg, is also only found much further south and not inbetween.

FLORISIC REGIONS

White (1983), classified the vegetation of Africa into 18 major phytochoria (floristic regions) based on the geographical distribution of plants (factors such as climate, geology, etc. are not considered). In this very broad categorisation, the Brandberg lies in the Karoo-Namib floristic region. Volk

(1966) indicated a Kaokoveld centre within the Karoo-Namib region that extended from the Brandberg northwards to southern Angola and Nordenstam (1974) listed taxa indicating such an affinity.
Based on this, a Kaokoveld centre of endemism was identified by the International Conservation Union (IUCN) as one of the centres of plant diversity and endemism for Africa (Beentje 1994). It was further defined on a datasheet (CPD site Af50) by Hilton-Taylor (1994). He includes the area from southwest Angola to the Hoanib River in the south, with the Brandberg as a disjunct outlier further south.

Based on an analysis of species distributions in the Manuleae, Hillard (1994) recognises a number of phytogeographic groups with the following being relevant to the Brandberg flora:

1. The Namibian western escarpment group: includes *Manuleopsis dinteri*, *Camtoloma rotundifolium*, *Jamesbrittenia chenopodioides*, *J. hereroensis*.
2. Namibia central and southern highland group: which includes *Manulea dubia*.
3. Arid northern Cape-Namibia group: *Jamesbrittenia adpressa*, *J. canescens* var. *canescens* and *J. tenella*
4. Karoo ubiquists group: no Manuleae in this group occur on the Brandberg, but *Euryops subcarnosus* was placed here by Nordenstam (1969).
5. The Kaokoveld and tropical African ubiquists groups do not include any Manulea found on the Brandberg.

The results of Hilliard (1994) indicate that as far as the Manuleae are concerned, Brandberg taxa are more allied to the mountains and plateaux south of the Brandberg than to those occurring in the Kaokoveld. Provisional results from ongoing analysis of the distributions of other plant groups found on the Brandberg, support this.
The position of the Brandberg within the Kaokoveld floristic region is therefore provisionally rejected.

IIMPACTS ON THE VEGETATION

1. Impact of humans on vegetation

The higher incidence of *Ricinus communis* in the vicinity of rock shelters, indicates that this species may have been introduced by early human inhabitants of the Brandberg that utilised the oil-rich seeds.
The main dietary components of the early human inhabitants of the Brandberg was probably the large edible tubers of *Ipomoea verbascoides*, which would have provided the most readily accessible and largest single source of carbohydrates and the Rock Dassie *Procavia capensis* (Pallas, 1766) (Procaviidae) meat, being the most readily available source of protein. The present-day distribution of *Ipomoea verbascoides* suggests an impact by human gathering over many millenia with lower occurrence along natural routes and areas more frequently occupied in the past.

The abutment of the lower northern slopes of the Brandberg to the Ugab River exposed these to greater human usage and disturbance. The Sonusib was the main access route for humans and livestock and as a result, the basaltic plains above were more heavily browsed by small stock than other parts of the massif.

Until recently, sheep paths were still visible on the Sonusib basalt plains. Here *Ipomoea verbascoides* is found at higher altitudes, which besides the effect of longer periods of sun exposure, may be the result of higher utilisation, perhaps in the form of collecting trips. Such visits may have been combined with visits to honey trees (*Acacia montis-usti, Moringa ovalifolia, Sterculia africana, S. quinqueloba* and *Ozoroa crassinervia*) or sojourns to graze small stock. In the Nuwuarib where the highest

incidence of honey trees is found, a survey in 1985 found a *Moringa ovalifolia* and an *Acacia montis-usti* tree still in use by bees, but no longer harvested by humans. Holes with chop marks still visible and then blocked with stones are a typical feature of tree-hives.
Acacia montis-usti trees do not naturally form hollow entrances in the outer trunk when they die. Earlier inhabitants learned to exploit a characteristic of this tree, namely that the softer core decays more rapidly than the outer following exposure, forming ideal cavities for bees to nest in.

As the location of dependable water holes has become more widely known, access by visitors has increased with a higher draw off by humans and adverse effects on animal and plant communities. Dry wood is scarce in the vicinity of waterholes and camping spots along the more popular climbing routes, and visitors are encouraged to use stoves using gas or paraffin rather than wood for fuel. Patchy removal of top soil by erosion on paths in these same areas has recently become noticeable and will have a detrimental effect on the vegetation, through, for example, root exposure, faster run-off and lower soil penetration.

Helicopters which visit the Brandberg for sightseeing usually remain air-borne, but landings for logistical purposes (the supply of water, food and equipment) and medical rescues are increasing. One helicopter landed to collect *Lithops* and this poses a possible threat to endangered species.

Impact of animals on vegetation

As with elsewhere in Namibia, periodic droughts affect the Brandberg and the subsequent lag in the recovery of animal life following such droughts, impacts on the vegetation. Prior to the severe drought of 1981-83 (84), for example, the population of dassies had built up excessively due to consecutive years of good rainfall. This was followed by a subsequent increase in the numbers of primary predators (Leopards *Panthera pardus* (Linneaus, 1758) (Felidae) and Black Eagles *Aquila verreauxi* Lesson, 1830 (Aquilidae). The onset of the drought coupled with over-browsing by dassies rapidly decreased leaf cover. As leaf cover decreased, dassies had necessarily to range wider for food and in so doing increasingly exposed themselves to predators, with the subsequent reduction in their population. As the dassie population decreased, that of their predators increased before subsequently slumping as their primary food source was reduced.

Cape Porcupines *Hystrix africaeaustralis* Peters, 1852 (Hystricidae), predominantly root and tuber feeders, are also preyed upon by leopards and followed a similar pattern of increase and decrease, as did the Klipspringer population. Starved leopards ravaged rucksacks in unguarded campsites (H. Pager pers com.) as well as plastic water bottle depots. At the end of the drought Black Eagles, Leopards and Porcupines had disappeared from the mountain. With the return of normal rain seasons, an absence of grazers and browsers enhanced plant life recovery, while the lack of predators could allow undisturbed recolonisation of the upper mountain from below.

RESULTS

[table 1]

Family	Taxon	Voucher	Zone	GF	Dist
Ophioglossaceae	*Ophioglossum polyphyllum* A.Braun	C4912, P59	1500-2000	fern	W
Pteridaceae	*Actiniopteris radiata* (Koenig ex Sw.) Link	C2255	950-1000	fern	W
	Cheilanthes dinteri Brause	C3992, C4022	B-2000	fern	S
	Cheilanthes eckloniana (Kunze) Mett.	C2423	1800-2150	fern	S
	Cheilanthes marlothii (Hieron.) Schelpe	C2271	1500-2000	fern	S
	Cheilanthes nielsii N.Jacobsen	C3759	1500-2000	fern	
	Cheilanthes parviloba (Sw.) Sw.	C2422, N2572	B-2570	fern	S
	Pellaea calomelanos (Sw.) Link	C3990	1000-1500	fern	W

Aspleniaceae	*Ceterach cordatum* (Thunb.) Desv.	N2799	2000-2575	fern	A
Marsileaceae	*Marsilea* sp.	C3981	2000-2500	fern	
Welwitschiaceae	*Welwitschia mirabilis* Hook.f.		B	T	A
Typhaceae	*Typha capensis* (Rohrb.) N.E.Br.	C2484, W1454	2100	Aq	S
Zannichelliaceae	*Zannichellia palustris* L.	N2530, N2531	B	Aq	S
Aponogetonaceae	*Aponogeton desertorum* Zeyh. ex A.Spreng.	C2464	1600	Aq	S
Poaceae	*Anthephora argentea* Goossens	DeW&H8224	B	P	BC
	Anthephora pubescens Nees	N2578	1500	P	Af
	Anthephora ramosa Goossens	G3630, cf. P9	B	P	N
	Anthephora schinzii Hack.	G3709	2000	A	S
	Aristida adscensionis L.	N2771	1700-2500	A	Af
	Aristida effusa Henrard	G3611	B	A	S
	Brachiaria deflexa (Schumach.) C.E.Hubb. ex Robyns	Boss 27383	B	A	W
	Brachiaria glomerata (Hack.) A.Camus	C716, G3652	B	A	S
	Cenchrus ciliaris L.	W1464	1850	P	W
	Centropodia mossamedensis (Rendle) T.A.Cope	Kers 2012	B	P	A
	Danthoniopsis dinteri (Pilg.) C.E.Hubb.	Kers 2008	B	A	Af
	Danthoniopsis ramosa (Stapf) Clayton	N3675	2000	S	C
	Enneapogon cenchroides (Roem. & Schult.) C.E.Hubb.	N2525, P39	B-1800	P	W
	Enneapogon desvauxii P.Beauv.	C1921	B-2300	A/P	W
	Enneapogon scaber Lehm. var. *scaber*	N2450	B	P	S
	Enneapogon scoparius Stapf	C721	B	P	Af
	Eragrostis annulata Rendle ex Scott-Elliot	N2459	B	A	AB
	Eragrostis aristata De Winter	N2477	B	A(Aq)	N
	Eragrostis echinochloidea Stapf	N2485	B	P (Aq)	S
	Eragrostis nindensis Ficalho & Hiern	C726, P4	1900	P	Af
	Eragrostis porosa Nees	P7, P66, P134	B-1900	A	Af
	Eragrostis rotifer Rendle	N2476, P33	B-2000	P	Af
	Eragrostis scopelophila Pilg.	P71, P138	1900	S	N
	Eragrostis walteri Pilg.	P.G.Meyer 1144	B	P	N
	Fingerhuthia africana Lehm.	P48	1900	P/A	Afd
	Melinis repens (Willd.) Zizka subsp. *grandiflora* (Hochst.) Zizka	N2488	B-1900	A	W
	Pennisetum foermeranum Leeke	C760, W1452	1900		N
	Phragmites australis (Cav.) Steud.	C2774, P125	1600	P	W
	Schmidtia kalahariensis Stent	Schweickerdt 2253	B	A	Af
	Setaria verticillata (L.) P.Beauv.	N2527, P14	B-1900	A	W
	Stipagrostis damarensis (Mez) De Winter	N&L884	B	P	N
	Stipagrostis hirtigluma (Trin. & Rupr.) De Winter subsp. *hirtigluma*	G3593, G3612	B	A	Af
	Stipagrostis hirtigluma (Trin. & Rupr.) De Winter subsp. *pearsonii* (Henrard) De Winter	N2481	B	A	A
	Stipagrostis hochstetteriana (Beck ex Hack.) De Winter var. *hochstetteriana*	C56, Oliver & Muller 6667	B	P	N
	Stipagrostis hochstetteriana (Beck ex Hack.) De Winter var. *secalina* (Henr.) De Winter	N2486	B	P	AC
	Stipagrostis uniplumis (Licht.) De Winter	G3594, P130	B-1900	A	N

	var. *intermedia* (Schweick.) De Winter				
	Stipagrostis uniplumis (Licht.) De Winter var. *uniplumis*	P52	1900	P	Af
	Tricholaena monachne (Trin.) Stapf ex C.E.Hubb.	G3608	B	A	Af
	Trichoneura eleusinoides (Rendle) E.Ekman	N2533	B	A	Af
	Triraphis ramosissima Hack.	P108, P137	1900	P	Af
Cyperaceae	*Bolboschoenus nobilis* (Ridl.) Goetgh. & Simpson	C2318, N2478	B		A
	Bulbostylis densa (Wall.) Hand.-Mazz.	C4044a	2000		S
	Bulbostylis humilis (Kunth) C.B.Clarke	N2808	2575		C
	Courtoisina assimilis (Steud.) Podlech	Kers 958	B		S
	Cyperus longus L. var. *longus*	C2469	1500		S
	Cyperus marginatus Thunb.	C246, N2479	B-1850		S
	Isolepis hemiuncialis (C.B.Clarke) J.Raynal	N2826	2000		C
	Lipocarpha rehmannii (Ridl.) Goetgh.	N2827, N2836	1900-2100		S
	Monandrus squarrosus (L.) Vorster ined.	C1399	B-1500		
	Schoenoplectus leucanthus (Boeck.) J.Raynal	Kers 927			S
Commelinaceae	*Commelina benghalensis* L.	C2311	1500-2000		W
Colchicaceae	*Androcymbium melanthioides* Willd.	C1391, W1435	2000-2500		S
Asphodelaceae	*Aloe dichotoma* Masson	C2370	1000-2000	T	C
	Aloe hereroensis Engl. var. *hereroensis*	B2689	200-2100	S	S
	Aloe hereroensis × viridiflora	B2710	2200	S	
	Aloe littoralis Baker	N2782	2000	S	Af
	Aloe viridiflora Reynolds	B2694	200-2100	S	N
Hyacinthaceae	*Albuca setosa* Jacq.	Oliver & Muller 6675	B	G	S
	Dipcadi glaucum (KerGawl.) Baker	P49	B-1900	G	S
	Dipcadi longifolium (Lindl.) Baker	B3598	750-850	G	Af
	Dipcadi platyphyllum Baker	B3599	750	G	S
	Ornithogalum pulchrum Schinz	N2565	1500	G	S
Eriospermaceae	*Eriospermum abyssinicum* Baker	B2656	2320	G	Af
	Eriospermum bakerianum Schinz subsp. *tortuosum* (Dammer) P.L.Perry	C745, C2278	1500-2000	G	N
	Eriospermum rautanenii Schinz	B3597		G	S
	Eriospermum roseum Schinz	B2358 C501	800-900	G	C
Asparagaceae	*Asparagus nelsii* Schinz	N2558	B-1300		S
	Asparagus pearsonii Kies	C2313	1500-2000		
	Asparagus retrofractus L.	N2815	2300		C
Amaryllidaceae	*Crinum minimum* Milne-Redh.	Pcf 123	1800	G	S
Velloziaceae	*Xerophyta viscosa* Baker	C1339	1500-2350		S
Iridaceae	*Gladiolus saccatus* (Klatt) Goldblatt & M.P.de Vos	C1392, N2778	B-2000	G	C?
	Lapeirousia gracilis Vaupel	C1341	1900-2300	G	N
	Lapeirousia rivularis Wanntorp	C2277	1500-2000	G	Af
Moraceae	*Ficus cordata* Thunb.	C576, C2152	1400	T	AB
	Ficus ilicina (Sond.) Miq.	N2777	1800	T	CA
	Ficus sycomorus L.	C2358, N2576	800-1850	T	Af
Urticaceae	*Forsskaolea candida* L.f.	N2442	B	H	C
	Forsskaolea hereroensis Schinz	C2151	1000-1500	H	C
	Forsskaolea intermediate sp.	N2522		H	
	Forsskaolea viridis Ehrenb. ex Webb	G3623	B-1900	H	Af
	Obetia carruthersiana (Hiern) Rendle	C4967	950-1500	T	A

Loranthaceae	*Oncocalyx welwitschii* (Engl.) Polhill & Wiens	P238	1800	Par/S	A
	Phragmanthera guerichii (Engl.) Balle	(Moisel 1982)		Par	
	Plicosepalus kalachariensis (Schinz) Danser	C4959, N2795	1100	Par/S	Af
	Tapinanthus oleifolius (J.C.Wendl.) Danser	G3636	1100	Par/S	S
Viscaceae	*Viscum capense* L.f.	C2768, P222	1800	Par/S	S
	Viscum rotundifolium L.f.	C2291		Par/S	S
Santalaceae	*Osyris lanceolata* Hochst. & Steud.	C1875, C2454	2000	T	Afd
Hydnoraceae	*Hydnora africana* Thunb.	C2765	1400	Par	S
Chenopodiaceae	*Atriplex vestita* (Thunb.) Aellen	W1432	2000	DS	Afd
	Chenopodium mucronatum Thunb	C2467, C3770	2000	H	S
	Chenopodium olukondae (Murr) Murr	C2467, P56a	1800-1980	H	S
	Lophiocarpus polystachyus Turcz.	DeW3156	B	H	S
	Salsola sp.	C1400	B	DS	
Amaranthaceae	*Amaranthus dinteri* Schinz subsp. *dinteri*	N&L887	B	H	S
	Amaranthus praetermissus Brenan	N&L876	B	H	Af
	Calicorema capitata (Moq.) Hook.f.	N2504	B	DS	C
	Cyathula cylindrica Moq.	N2831	2520	H/DS	Af
	Cyathula sp. = Craven 1877, Craven 2362	C1406	2520	DS	
	Hermbstaedtia argenteiformis Schinz	C2235	1500-2000	H	A
	Hermbstaedtia spathulifolia (Engl.) Baker	C2181, N2502	B	H	N
	Leucosphaera bainesii (Hook.f.) Gilg	C2265	B- 2000	DS	Af
	Marcelliopsis denudata (Hook.f.) Schinz	van Wyk 689	B	S	A
	Marcelliopsis splendens (Schinz) Schinz	C753, N2510	B-1800	S	N
	Nelsia quadrangula (Engl.) Schinz	C4083, P286	B-1500-2000	H	AB
	Pupalia lappacea (L.) A.Juss. var. *lappacea* *	C1100, C2150	1500-2000	H	*
	Sericocoma heterochiton Lopr.	C727, G3641	B & 1500-2000	DS	S
	Sericorema sericea (Schinz) Lopr.	C1984, C2274	1500-2000	H	AS
Nyctaginaceae	*Boerhavia coccinea* Mill. *	G3602	B	H	*
	Boerhavia deserticola Codd	C2169, N2444	B -2000	H	N
	Boerhavia diffusa L. *	C491	1500-2000	H	*
	Boerhavia hereroensis Heimerl	P87		H	C
	Commicarpus squarrosus (Heimerl) Standl.	C490, N2545	B- 1500	DS	Afd
	Phaeoptilum spinosum Radlk.	C3943, N2499	650-2000	S	S
Gisekiaceae	*Gisekia africana* (Lour.) Kuntze	N2461, NP117	B-1800	H	Af
Molluginaceae	*Corbichonia decumbens* (Forssk.) Exell	C2238	B & 1500-2000	H	Afd
	Hypertelis bowkeriana Sond.	N2568	1500	H	W
	Hypertelis salsoloides (Burch.) Adamson	C1409	2000	H	S
	Limeum argute-carinatum Wawra & Peyr.	N2497, NP59b	B-1500	H	S
	Limeum dinteri G.Schellenb.	G3710	B	H/DS	Af
	Limeum myosotis H..Walter	N&L864	B	H	AB
	Mollugo cerviana (L.) Ser. ex DC.	N2521	650-1800	H	W
Aizoaceae	*Aizoanthemum dinteri* (Schinz) Friedrich	C2167, W1446	2100	H	N
	Aizoon virgatum Welw. ex Oliv.	C2224, C3768	2000	H/DS	A
	Galenia africana L.	N2556a	B & 1500-2000	DS	C
	Sesuvium sesuvioides (Fenzl) Verdc.	N2491	B	H	S
	Tetragonia arbuscula Fenzl	C2361, W1431	2600	S	S
	Tetragonia calycina Fenzl	C2471	1800-2500	DS	S
	Tribulocarpus dimorphanthus (Pax) S. Moore	Kers 1020	B	DS	Afd

Mesembryanthemaceae	*Aptenia geniculiflora* (L.) Bittrich	C1878, C1882	1500-2300	Suc	S
	Hereroa puttkamerana (A.Berger & Dinter) Dinter & Schwantes	C1873, C1924	2000-2500	Suc	C
	Lithops gracilidelineata Dinter subsp. *brandbergensis* (de Boer) D.T.Cole	(Cole 1988)	2300-2400	Suc	E
	Lithops gracilidelineata Dinter subsp. *gracilidelineata*	(Cole 1988)	B	Suc	N
	Mesembryanthemum guerichianum Pax	C2360	1500-2000	Suc	S
Portulacaceae	*Anacampseros albissima* Marloth	N3678	2300	Suc	C
	Portulaca kermesina N.E.Br.	C4943	2000	H	Af
	Portulaca oleracea L. *	C2462	1700	H	*
	Talinum sp. = Bruyns 3604	C1346 C1436	950-1500		
Caryophyllaceae	*Dianthus namaensis* Schinz	C1340, 2364	2300	H	C
	Silene pilosellifolia Cham. & Schltdl.	N2804	2575	H	S
Ranunculaceae	*Clematis brachiata* Thunb.	C3763, C3995	2000	C	Af
Menispermaceae	*Antizoma miersiana* Harv.	C2760, C3943	1500-2000	S	C
Brassicaceae	*Erucastrum arabicum* Fisch. & C.A.Mey.	C2243	1500-2000	H	Af
	Heliophila minima (Stephens) Marais	P63	1800-2400	H	S
	Lepidium africanum (Burm.f.) DC. subsp. *divaricatum* (Aiton) Jonsell	N2802	2575	H	W
Capparaceae	*Boscia albitrunca* (Burch.) Gilg & Benedict	C1872	B-1500	T	Af
	Boscia foetida Schinz subsp. *foetida*	C2378	745-1800	S	S
	Cadaba schroeppelii Suess.	C4853, N2512	B-1500	S	A
	Cleome angustifolia Forssk. subsp. *diandra* (Burch.) Kers	C4053, G3655	B	H	S
	Cleome elegantissima Briq.	C2087	1500-2000	H	S
	Cleome foliosa Hook.f. var. *foliosa*	N2495	B- 2000	H	AC
	Cleome foliosa Hook.f. var. *lutea* (Sond.) Codd & Kers	C2170, G3701	1500	H	C
	Cleome foliosa var. foliosa transitional to var. namibensis	H&DeW 1504	B	H	
	Cleome gynandra L.	(Craven)	B		S
	Cleome oxyphylla Burch. var. *oxyphylla*	C1342, N2576	1850	H	Af
	Cleome semitetrandra Sond.	C765	1500-2000	H	AC
	Cleome suffruticosa Schinz	C493, C2195	B & 1500-2000	H	N
	Maerua juncea Pax subsp. *juncea*	C2409	B	C/S	Af
	Maerua parvifolia Pax	C2261	1500-2000	S	Af
	Maerua schinzii Pax	C768	1500-2000	T	AB
Moringaceae	*Moringa ovalifolia* Dinter & A.Berger	(Craven)	B	T	A
Crassulaceae	*Adromischus schuldtianus* (Poelln.) Poelln. subsp. *schuldtianus*	B3302	2250	Suc	N
	Cotyledon orbiculata L.	Logan 77	B-1500	Suc	C
	Crassula subaphylla (Eckl. & Zeyh.) Harv. var. *subaphylla*	B2748	2300-2400	Suc	S
	Crassula tabularis Dinter	B2837	2300	Suc	S
	Kalanchoe lanceolata (Forssk.) Pers.	C1455, W1444	2000	Suc	Af
Vahliaceae	*Vahlia capensis* (L.f.) Thunb.	C1394, N2490	650-2000	H	Af
Montiniaceae	*Montinia caryophyllacea* Thunb.	C1457, N2785	1600-2000	S	
Myrothamnaceae	*Myrothamnus flabellifolius* Welw.	(Craven)	2000	DS	Af
Fabaceae:	*Acacia erioloba* E.Mey.	P126	B-1500	T	S
Subfamily:	*Acacia hereroensis* Engl.	C570, N2775	1700-2100	T	S
Mimosoideae	*Acacia montis-usti* Merxm. & A.Schreib.	N2528	650- 1800	T	N

	Acacia reficiens Wawra subsp. *reficiens*	C769, C2204	1500-2000	T	A
	Acacia senegal (L.) Willd. var. *rostrata* Brenan		1500	T	A
	Elephantorrhiza suffruticosa Schinz	C1117, P5	1800	S	Af
	Faidherbia albida (Delile) A.Chev.	(Craven)	B	T	Af
Subfamily: Caesalpinioideae	*Adenolobus garipensis* (E.Mey.) Torre & Hillc.	G3646	B-1800	S	AC
	Adenolobus pechuelii (Kuntze) Torre & Hillc. subsp. *pechuelii*	C24	B	DS	AB
	Caesalpinia rubra (Engl.) Brenan	C764	2000	DS	AB
	Parkinsonia africana Sond.	N2552	B-1200	T	S
	Senna italica Mill. subsp. *arachoides* (Burch.) Lock	P253	B	H	S
Subfamily: Papilionoideae	*Crotalaria barnabassii* Dinter ex Baker f.	N2496	B	H	S
	Crotalaria damarensis Engl.	C80, C773	2000	H	S
	Cullen obtusifolia (DC.) C.H.Stirt.	N&L871	B	H	S
	Ptycholobium biflorum (E.Mey.) Brummitt subsp. *angolensis* (Baker) Brummitt	C4960	1200	DS	A
	Cyamopsis senegalensis Guill. & Perr.	C1419, G3659	B	H	Afd
	Indigastrum argyoides (E.Mey.) Schrire	C16	B	H	
	Indigofera adenocarpa E.Mey.	C79, C2192	B-1000	DS	C
	Indigofera auricoma E.Mey.	C2168, G3607	B-1500	H	C
	Indigofera pechuelii Kuntze	P717, N2507	B	DS	N
	Indigofera teixeirae Torre	N2448	B-1500	H	A
	Lessertia benguellensis Baker f.	C4858, P259	1800	H	S
	Lotononis platycarpa (Viv.) Pic.Serm.	C cf. 1407, N&L859	B	H	W
	Microcharis disjuncta (J.B.Gillett) Schrire var. *disjuncta*	C2184, N2449	B	H	Afd
	Mundulea sericea (Willd.) A.Chev.	N3650	2000	S	Af
	Rhynchosia candida (Welw. ex Hiern) Torre	N2474	B	DS	A
	Rhynchosia minima (L.) DC.	C2191, C2488		H	S
	Rhynchosia sp. = Craven 2761	C1336			
	Rhynchosia totta (Thunb.) DC.	C2149, C3771		H	S
	Sesbania pachycarpa DC. subsp. *dinterana* J.B.Gillett	N2480	B-1800	H	N
	Sutherlandia frutescens (L.) R.Br. ex Aiton	C1884, W1469	1950-2300	DS	S
	Tephrosia dregeana E.Mey.	N2494	B	H	S
	Tephrosia monophylla Schinz	C2174, G3661	B & 1500-2000	H/DS	N
	Tephrosia rhodesica Baker f. var. *rhodesica*	N3646	2000	DS	S
	Tephrosia villosa (L.) Pers. subsp. *ehrenbergiana* (Schweinf.) Brummitt	C2286	B	DS	Af
Geraniaceae	*Monsonia senegalensis* Guill. & Perr.	N2500	B	H	Afd
	Monsonia umbellata Harv.	C2188, G3585	B	H	CA
	Pelargonium minimum (Cav.) Willd.	C cf.l 1401	2000	H	S
	Pelargonium otaviense R.Knuth	C2773, N2814	1900-2300	DS	N
	Sarcocaulon marlothii Engl.	C1464	B	DS	N
Oxalidaceae	*Oxalis purpurascens* Salter	C2473, N2554	1350-2000	H/G	S
Zygophyllaceae	*Tribulus terrestris* L.	C2306	1500-2000	H	W
	Tribulus zeyheri Sond.	C777, N2513	B-2000	H	S
	Zygophyllum simplex L.	N2514	B-1800	H	Afd
	Zygophyllum spongiosum ined.	M&G359, Strey 2403		H	

Rutaceae	*Thamnosma africana* Engl.	C751, G3592	B-1900	DS	S
Burseraceae	*Commiphora glaucescens* Engl.	C747	B-1900	T	A
	Commiphora kraeuseliana Heine	C1675, N2458	B	S	N
	Commiphora pyracanthoides Engl.	C2203	1500-2000	S	Af
	Commiphora saxicola Engl.	C117, N2456	B-1800	S	N?A
	Commiphora tenuipetiolata Engl.	C2331, Ccf. 2752	1500	S/T	Af
	Commiphora virgata Engl.	C2166, N2455	B-1500	S	N
	Commiphora wildii Merxm.	G3589	B	S	A
Polygalaceae	*Polygala guerichiana* Engl.	C755, N2511	B-1800	DS	N
	Polygala leptophylla Burch.	C757	B	H/DS	S
Euphorbiaceae	*Croton gratissimus* Burch. var. *gratissimus*	C581, W1468	1400	S	S
	Euphorbia chamaesycoides B.Nord.	C2380, N2567	B-1600	H	N
	Euphorbia gariepina Boiss subsp. *balsamea* (Hiern) L.C.Leach	C2735	B-1000	Suc	A
	Euphorbia glanduligera Pax	C2977, N2446	B-1800	H	S
	Euphorbia guerichiana Pax	C770, C1347	1500-1800	T	S
	Euphorbia inaequilatera Sond.	C4202, N&L836	B	H	S
	Euphorbia mauritanica L. var. *mauritanica*	C2301, C2325	1400-1800	Suc	S
	Euphorbia monteiroi Hook.f subsp. *brandbergensis* B.Nord.	C348, N2786	1750-2000	Suc	N
	Euphorbia phylloclada Boiss.	C102, C749	B	H	Af
	Euphorbia virosa Willd.	(Craven)	1500-2000	Suc	AC
	Phyllanthus maderaspatensis L.	C771	B-1800	H	W
	Phyllanthus pentandrus Schumach. & Thonn.	C2736, N2542	B	DS	S
	Ricinus communis L. *	N2523	B-1800	S	*
	Seidelia firmula (Prain) Pax & K.Hoffm.	N2773	1700	H	C
Anacardiaceae	*Ozoroa crassinervia* (Engl.) R.R.& A.Fern.	C572, N3642	1400-2000	T	C
	Rhus burchellii Sond. ex Engl.	C573, C1920	1800-2000	S	S
	Rhus marlothii Engl.	C577, C2769	1800-2000	S	S
Celastraceae	*Gymnosporia senegalensis* (Lam.) Loes.	C2289, P556	1500-2000	T	Af
Sapindaceae	*Cardiospermum pechuelii* Kuntze	C1456, N2817	B-1950	DS/C	S
Melianthaceae	*Melianthus comosus* Vahl	C2452	2400	DS	S
	Helinus integrifolius (Lam.) Kuntze	C767	B-1500	C/DS	Af
Vitaceae	*Cyphostemma currorii* (Hook.f) Desc.	C81	1500-2000	T	A
Tiliaceae	*Corchorus asplenifolius* Burch.	C2267, C4034	1500-2000	H	Af
	Corchorus merxmuelleri Wild	C2491, N2550	1200-2000	DS	N
	Corchorus tridens L. *	N&L873	B	H	*
	Grewia bicolor Juss.	C2410, G3696	B	S	W
	Grewia tenax (Forssk.) Fiori	C4964		S/T	Af
	Grewia villosa Willd.	C4201	B-1800	S	W
Malvaceae	*Abutilon fruticosum* Guill. & Perr.	C588	B	H/DS	W
	Abutilon pycnodon Hochr.	C758, N2583	B- 1800	H/DS	S
	Gossypium anomalum Wawra ex Wawra & Peyr. subsp. *anomalum*	C1418, N2466	B-1400	S	A
	Hibiscus castroi Baker f. & Exell	C2745, P157	B-1800	H	A
	Hibiscus dinteri Hochr.	C2483	B-1000	DS	N
	Hibiscus elliottiae Harv.	C1348, C1771	B	S	S
	Hibiscus engleri K.Schum.	C1343, N2438	B- 1900	H	S
	Hibiscus fleckii Gürke	C2732	1500-2000	H	N
	Hibiscus micranthus L.f.	N2784	1750	DS	W

	Pavonia burchellii (DC.) R.A.Dyer	C3774		H/DS	
	Pavonia rehmannii Szyszyl.	C2754, G3656	B-1500	DS	N
Sterculiaceae	*Dombeya rotundifolia* (Hochst.) Planch. var. *rotundifolia*	C580, N3643	1500-2000	T	Af
	Hermannia affinis K.Schum.	N2508	B	DS	C
	Hermannia amabilis Marloth ex K.Schum.	C78, N2443	B-1000	H	N
	Hermannia elliottiana (Harv.) K.Schum.	C571, N2812	2300	DS	N
	Hermannia helianthemum K.Schum.	N2792	1000	DS	N
	Hermannia merxmuelleri Friedr.-Holzh.	C1683, N2794	1050-2000	S	E
	Hermannia minutiflora Engl.	C3780	1500	DS	C
	Hermannia modesta (Ehrenb.) Mast.	P62, N2493	B-1990	H	Afd
	Hermannia solaniflora K. Schum	G3610	B	H	N
	Hermannia sp. = Craven 2197	C2197	1500		
	Hermannia tigrensis Hochst. ex A.Rich.	C2978	B	H	Af
	Melhania damarana Harv.	C2741, W1415	1400-1950	H/DS	S
	Melhania sp.= Craven 2482	C2462	1000		
	Sterculia africana (Lour.) Fiori	N2470	B	T	Af
	Sterculia quinqueloba (Garcke) K.Schum.	C1453, N2577	1000-2000	T	Af
Tamaricaceae	*Tamarix usneoides* E.Mey. ex Bunge	N2524	B	T	Af
Passifloraceae	*Adenia pechuelii* (Engl.) Harms	C1078, C1116	1500	S	N
	Adenia repanda (Burch.) Engl.	C2088, C2474	1800-2000	DS	Af
Loasaceae	*Kissenia capensis* Endl.	N2473	B	H	C
Lythraceae	*Nesaea luederitzii* Koehne var. *luederitzii*	C2232, N2789	B-2000	H/DS	S
Combretaceae	*Combretum imberbe* Wawra	(Craven)	B	T	Af
	Terminalia prunioides M.A..Lawson	C4965	Bush	T	Af
Apiaceae	*Phlyctidocarpa flava* Cannon & Theobald	C2156, C4460	1800	H	N
Plumbaginaceae	*Dyerophytum africanum* (Lam.) Kuntze	C85, G3697	B	DS	AC
	Plumbago wissii Friedrich	C1333, N2822	2200-2500	DS	N
Ebenaceae	*Diospyros acocksii* (De Winter) De Winter	C1463, P25	B-1800	S	C
	Euclea pseudebenus E.Mey. ex A.DC.	(Craven)	B	T	A
	Euclea undulata Thunb. var. *myrtina* (Burch.) Hiern	C2461, N2475	B-2000	S	S
Oleaceae	*Olea europaea* L. subsp. a*fricana* (Mill.) P.S.Green	C2460, W1428	2500	S	W
Salvadoraceae	*Salvadora persica* L.	C4963	B	T	Af+
Apocynaceae	*Curroria decidua* Planch. ex Hook.f. & Benth.	C84, N2457	B	S	AC
	Hoodia gordonii (Masson) Sweet ex Decne.	B3596	950-2000	Suc	C
	Microloma hereroense Wanntorp	C762, C2307	2575	DS	N
	Orbea rangeana (Dinter & A.Berger) L.C.Leach	B2357	1400-2200	Suc	N
	Pergularia daemia (Forssk.) Chiov. var. *leiocarpa* (K.Schum.) H.E.Huber	C2275	1500-2000	C	S
	Sarcostemma viminale (L.) R.Br. subsp. *thunbergii* (Don) Liede & Meve	C750	1800-2000	Suc	S
	Stapelia kwebensis N.E.Br.	C2762	1400	Suc	S
	Stapelia longipedicellata (A.Berger) N.E.Br.	B3602	1100	Suc	N
	Stapelia sp. = Nordenstam 2860	N2860	1400	Suc	
	Tylophora fleckii (Schltr.) N.E.Br.	B3319	2350	DS	N/Afd
Convolvulaceae	*Convolvulus sagittatus* Thunb.	C2312, N3672	2000	C	C
	Cuscuta planiflora Ten.	C4198, N2796	1100	Par	W
	Evolvulus alsinoides (L.) L.	C2281	1800	H	Af

	Ipomoea adenioides Schinz	C1979	B	DS	Af
	Ipomoea sp.	C4962			
	Ipomoea verbascoidea Choisy	C486, N3647	2000	C/DS	Af
	Merremia guerichii A.Meeuse	C2193, N2515	B	DS	N
	Seddera schizantha Hallier f.	C2163, C2178	B-2000	H/DS	A
Hydrophyllaceae	*Codon schenckii* Schinz	N2519	B	H	C
Boraginaceae	*Cordia sinensis* Lam.	C2320, C2407	B	T	Af
	Ehretia rigida (Thunb.) Druce	C4876	1500	T	Af
	Heliotropium albiflorum Engl.	N2546	1000	H	N
	Heliotropium rariflorum Stocks subsp. *hereroense* (Schinz) Verdc.	C2755	2000	DS	N
	Heliotropium steudneri Vatke	C2205	1500-2000	H	Af
	Heliotropium tubulosum E.Mey. ex DC.	C2207, C2260	2000	H	AC
	Trichodesma africanum (L.) Lehm.	N2447	B	H	S
Verbenaceae	*Chascanum garipense* E.Mey.	C2481, N2520	B-2000	H	C
	Chascanum pinnatifidum (L.f.) E.Mey.	G3718	B	H	S
	Lantana dinteri Moldenke	C1344	2000	DS	A
Lamiaceae	*Acrotome fleckii* (Gürke) Launert	C2742, N2564	B-1900	H	N
	Aeollanthus neglectus (Dinter) Launert	C2426	2000-2400	H	AS
	Hemizygia floccosa Launert	C1678	B	DS	N
	Leonotis ocymifolia (Burm.f.) Iwarsson var. *raineriana* (Vis.) Iwarsson	C2766, N2832	2520	DS	S
	Leucas glabrata (Vahl) Sm. var. *glabrata*	N2574	1500-1600	DS	Af
	Leucas pechuelii (Kuntze) Gürke	C1459, 1679	2000	DS	A
	Mentha longifolia (L.) L. subsp. *wissii* (Launert) Codd	C1186, W1440	1500-2000	H	E
	Ocimum americanum L. var. *americanum*	C2219	1500-2000	H	
	Plectranthus hereroensis Engl.	C484, N2539	B-2000	H	Af
	Salvia garipensis E.Mey. ex Benth.	C854, G3640	2000	DS	C
	Tetradenia riparia (Hochst.) Codd	C487, C2475	2000	DS	Af
	Tinnea rhodesiana S.Moore	C1681, C2089	1500-2000	S	Af
Solanaceae	*Lycium eenii* S.Moore	G3632	1500- 2300	S	N?
	Lycium prunus-spinosa Dunal	C2248, C2310	1800-2200	S	S
	Nicotiana africana Merxm.	C579, C1402	1500	S	N
	Solanum nigrum L. *	C4027, N2571	1500-2575	H	*
	Solanum rigescentoides Hutch.	C2746, N2484	B	S	N
Scrophulariaceae	*Alectra pseudobarleriae* (Dinter) Dinter	O, S & M 6671A	B-1800	par	N
	Anticharis ebracteata Schinz	G3715	B	H	N
	Anticharis imbricata Schinz	N&L849	B	H/DS	N
	Anticharis inflata Marloth & Engl.	N2790	1100-2000	H	N
	Anticharis linearis (Benth) Hochst. ex Asch.	N&L850	B	H	W
	Aptosimum angustifolium Weber & Schinz	C74, N2462	B	H	N
	Aptosimum lineare Marloth & Engl.	C2211	1500	H	Af
	Camptoloma rotundifolium Benth.	N2532	B	H	A
	Chamaegigas intrepidus Dinter	C3988	2000	H(aq)	N
	Diclis petiolaris Benth.	N2573	1500	H	Af
	Hebenstretia integrifolia L.	C1408, N2807	2000-2575	H	S
	Jamesbrittenia chenopodioides Hilliard	N2543	B	H	N
	Jamesbrittenia hereroensis (Engl.) Hilliard	G3677, N2540	B-1900	H	N
	Jamesbrittenia huillana (Diels) Hilliard	N2797	2580	DS	Af
	Jamesbrittenia tenella (Hiern) Hilliard	N2540	B	H	C

	Limosella grandiflora Benth.	N2835, P386	1900	H(aq)	S
	Manulea dubia (Skan) Overkott ex Roessler	C1335, N2772	1700-2000	H	N
	Manuleopsis dinteri Thell.	C584, C2270	1600-2000	S	N
	Nemesia fruticans (Thunb.) Benth.	C1232, N2774	1700-1900	H	S
	Nemesia lilacina N.E.Br.	N2787	1200	H	S
	Selago alopecuroides Rolfe	C2424	2000	H	A
	Selago lepida Hilliard	C852, 2468	2080	DS	N
	Striga gesnerioides (Willd.) Vatke ex Engl.	N2580	B-1800	par	W
	Veronica anagallis-aquatica L.	W1439	B	H(aq)	W
Bignoniaceae	*Catophractes alexandri* D.Don	C4975		S	Af
Pedaliaceae	*Rogeria adenophylla* Gay ex Delile	C2237, N2463	B -2000	H	Af
	Sesamum capense Burm.f.	C4077, G3681	B-1800	H	S
	Sesamum marlothii Engl.	C119, N2451	B-1800	H	N
	Sesamum rigidum Peyr. subsp. *merenskyanum* Ihlenf. & Seidenst.	C2246	1500-2000	DS/S	N
	Sesamum schinzianum Asch.	G3596	B	H/DS	N
Acanthaceae	*Barleria dinteri* Oberm.	Boss TRV36187	B	DS	N
	Barleria kaloxytona Lindau	C1676	1500-2000	DS	N
	Barleria lancifolia T.Anderson	C1923, G3665	B-1500	DS	N
	Barleria merxmuelleri P.G.Mey.	C766, W1411	1500-2000	DS	N
	Barleria prionitis L.	C2231, G3671	B-1500-2000	DS	N
	Barleria senensis Klotzsch	Kers 1027	B	DS	S
	Barleria solitaria P.G.Mey.	G9713	B	DS	N
	Blepharis bossii Oberm.	M&G1650	B	DS	N
	Blepharis grossa (Nees) T.Anderson	C2179	1500-2000	H	A
	Blepharis mitrata C.B.Clarke	P235	B	H	C
	Blepharis obmitrata C.B.Clarke	C2288, N2464	B-2000	H	AB
	Hypoestes forskaolii (Vahl) R.Br.	N2800	2500	H	S
	Monechma cleomoides (S.Moore) C.B.Clarke	C2260, N2439	B- 2000	DS	A
	Monechma divaricatum (Nees) C.B.Clarke	C1461, N2781	1600	DS	S
	Peristrophe namibensis K.Balkwill subsp. *brandbergensis* K.Balkwill	C489, C2296	1300-2000	DS	N
	Petalidium canescens (Engl.) C.B.Clarke	C1674, N2505	B-1000	DS	N
	Petalidium lanatum (Engl.) C.B.Clarke	C2747, G3658	B	DS	N
	Petalidium luteo-album A.Meeuse	C4060	B	DS	N
	Petalidium spiniferum C.B.Clarke	C2975	B & 1500-2000	DS	A
	Petalidium variabile (Engl.) C.B.Clarke	C2975, G3657	B	DS	A
	Ruellia brandbergensis Kers	C2153, N2562	1400-1900	DS	E
	Ruellia diversifolia S.Moore	N2452	B	DS	A
	Ruellia sp.= aff. *R. diversifolia*	C3268	B		
Rubiaceae	*Amphiasma merenskyanum* Bremek.	C4050, N2465	B	DS	A
	Kohautia caespitosa W.Schnizl. subsp. *brachyloba* (Sond.) D.Mantell	C120, 2309	B	H	Af
	Kohautia cynanchica DC.	N2445	B	H	Af
Cucurbitaceae	*Citrullus ecirrhosus* Cogn.	M&G1651	B	C	
	Citrullus lanatus (Thunb.) Matsum. & Nakai	N2512	B	H/C	Af
	Citrullus rehmii De Winter	G3712	B	C	N
	Coccinia rehmannii Cogn.	C2478, C4069	B & 1500-	C	Af

			2000		
	Corallocarpus schinzii Cogn.	C485, C4014	2300	C	C
	Corallocarpus welwitschii (Naudin) Hook.f. ex Welw.	C2251, N3673	2000	C	S
	Cucumella aspera (Cogn.) C.Jeffrey	C2250, N2468	B-2000	C	N/A
	Cucumella clavipetiolata J.H.Kirkbr.	N3657, P145	1500-2000	H/C	N
	Cucumis meeusei C.Jeffrey	C3276, G3721	B-1500	C	S
	Cucumis sagittatus Peyr.	C2737	B	C	AC
	Dactyliandra welwitschii Hook.f.	N246, N2516	B	C	A
	Momordica humilis (Cogn.) C.Jeffrey	G3693	B	C	N?A
Campanulaceae	*Wahlenbergia denticulata* (Burch.) A.DC.	C1879, N2806	2580	H	S
Asteraceae	*Antiphiona fragrans* (Merxm.) Merxm.	C9466	B	DS	N
	Aspilia eenii S.Moore	C578, C3984	1100-2000	DS	N
	Berkheya spinosissima (Thunb.) Willd. subsp. *spinosissima*	C2299, N2549	900-2000	H	C
	Bidens biternata (Lour.) Merr. & Sherrf *	C2308, P140	1500-2000	H	*
	Calostephane divaricata Benth.	C2739, G3694	B & 1500-2000	H	Af
	Cineraria canescens Wendl. ex Link	C2456, N3659	2000	DS	S
	Dicoma capensis Less.	G3684	B	H	S
	Dicoma tomentosa Cass.	C752, N2454	B-1800	H	W
	Emilia marlothiana (O.Hoffm.) C.Jeffrey	N2554	1000-1800	H	A
	Engleria africana O.Hoffm.	C2302, N2472	B-1400	H	N
	Eriocephalus dinteri S.Moore	C2263, N2779	1800-2000	DS	N
	Eriocephalus pinnatus O.Hoffm.	C754, G3653	B	DS	N
	Euryops subcarnosus DC. subsp. *vulgaris* B.Nord.	C1337, N2829	2200	DS	S
	Felicia anthemidodes (Hiern) Mendonça	C2185, N2501	B	H	AB
	Felicia clavipilosa Grau subsp. *clavipilosa*	C2480, G3624	2000	S	S
	Felicia filifolia (Vent.) Burtt Davy subsp. *schaeferi* (Dinter) Grau	N2825	2300	S	C
	Felicia gunillae B.Nord.	N2803	2500	S	E
	Felicia hirsuta DC.	C2489, N2828	2200	S	S
	Felicia microsperma DC.	C2300	2000	H	C
	Felicia smaragdina (S.Moore) Merxm.	G3688	B	H	N
	Geigeria acaulis Benth. & Hook.f. ex Oliv. & Hiern	C2230	B & 1500-2000	H	Afd
	Geigeria alata (DC.) Benth. & Hook.f. ex Oliv. & Hiern	C4081, N2467	B-1800	H	Af
	Geigeria ornativa O.Hoffm. subsp. *ornativa*	W1463	1850	H	S
	Helichrysum candolleanum H.Buek	N2776	1800	H	S
	Helichrysum fleckii S.Moore subsp. *fleckii*	C2420, N3664	2150	H	
	Helichrysum herniarioides DC.	N3662	2000	H	C
	Helichrysum roseo-niveum Marloth & O.Hoffm.	N&L 846	B	H	A
	Helichrysum tomentosulum (Klatt) Merxm. subsp. *aromaticum* (Dinter) Merxm.	G3635, P42	B	DS	C
	Helichrysum tomentosulum (Klatt) Merxm. subsp. *tomentosulum*	C2458	2000	DS	AB
	Helichrysum zeyheri Less.	P2458, N2798	2580	DS	S
	Hirpicium gazanioides (Harv.) Rössler	C1677, N2503	B -1500	H	S
	Hirpicium gorterioides (Oliv. & Hiern) Rössler subsp. *gorterioides*	C81	2000	H	S
	Kleinia longiflora DC.	C1099, N2570	1600-2000	Suc DS	S

	Launaea intybacea (Jacq.) P.Beauv.	N2482	B-2000	H	W
	Leysera tenella DC.	C1396, N2823	1900-2300	H	S
	Litogyne gariepina (DC.) Anderb.	Kers 992	B	H/DS	
	Myxopappus acutilobus (DC.) Källersjö	N2543	B	H	C
	Myxopappus hereroensis (O.Hoffm.) Källersjö	C1166, P261	B	H	N
	Nidorella nordenstamii Wild	N3663	2000	H	E
	Ondetia linearis Benth.	C2315, N2538	B-2000	H	N
	Osteospermum muricatum E.Mey. ex DC. subsp. *longiradiatum* T.Norl.	C2455	1900	H	B
	Othonna brandbergensis B.Nord	C2303, N2780	1850-2000	S	N
	Pechuel-Loeschea leubnitziae (Kuntze) O.Hoffm.	Sullivan 336	B	S	S
	Pegolettia oxyodonta DC.	N2793	1050	H	C
	Pegolettia senegalensis Cass.	G3621	1000	H	S
	Pentatricha petrosa Klatt	Oliver n.s.	B	H/DS	C
	Pentzia tomentosa B.Nord.	N2821	2000	DS	E
	Philyrophyllum schinzii O.Hoffm.	C1096, N2548	1000-2000	H	S
	Pluchea dioscoridis (L.) DC.	P242	1800	DS	Af
	Pteronia cylindracea DC.	C1883	2000	DS	S
	Pteronia glauca Thunb.	N2830	2300	DS	S
	Pteronia mucronata DC.	C1097, N2824	2300	DS	S
	Senecio alliariifolius O.Hoffm.	N2566	B-1500	DS	N
	*Senecio cinerascen*s Aiton	C1454, N2833	2000-2400	DS	C
	*Senecio consanguineu*s DC.	N&L 884	B	H	S
	Senecio eenii (S.Moore) Merxm.	C1398, N2555	B-1900	H	S
	Senecio flavus (Decne.) Sch.Bip.	N2575	1500	H	Af
	Senecio inaequidens DC.	N3661	2000	H/DS	Af
	Senecio linifolius L.	N3670	1500	DS	
	Tripteris angolensis (T.Norl.) B.Nord.	C772, N2560	B-2000	DS	A
	Tripteris microcarpa Harv. subsp. *septentrionalis* (T.Norl.) B.Nord.	C2976, N2441	B & 1500-2000	H	?A
	Tripteris nervosa Hutch.	C20, N2818	B	H	N
	Ursinia nana DC.	C1403, W 1447	1900-2000	H	Af
	Vernonia cinerascens Sch.Bip.	C2753	B	S	W
	Vernonia obionifolia O.Hoffm. subsp. *obionifolia*	C2740, N2440	B	S	N?A

CONCLUSIONS

The physical isolation of the Brandberg with its wide diversity of plants, insects and other animal life, together with its abundance of rock art sites, makes it a unique asset that needs urgent protection. Proclamation as a National Monument site has not afforded it the necessary protection, especially where plants are concerned.

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REFERENCES

BALKWILL, K. & GETLIFFE NORRIS, F. 1985. Taxonomic studies on the Acanthaceae: the genus *Hypoestes* in southern Africa. *South African Journal of Botany* **51**: 133-144.

BALKWILL, K., BALKWILL, M.-J. & Getliffe Norris, F.M. 1988. Taxonomic studies in the Acanthaceae: the *Peristrophe grandibracteata* complex. *South African Journal of Botany* **54**: 47-54.

BEENTJE, H. J. 1994. Regional overview: Africa (pp. 101-116). In DAVIS, S. D. & HEYWOOD, V. H. (eds). *Centres of plant diversity: a guide and strategy for their conservation*. Oxford University Press,

BREUNIG, P. 1988a. Botanisch-archäologische Beobachtungen in einem afrikanischen Hochgebirge. Aspekte zur prähistorischen Besiedlung eines ariden Kunstraumes. *Archäologische Information* **11**: 53-73.

BREUNIG, P. 1988b. Pfostenbauten im Hohen Brandberg. *SWA Scientific Society Newsletter* **29**: 1-7.

BREUNIG, P. 1990. Temperaturen und Niederschläge im Hohen Brandberg. *Journal of the Namibian Scientific Society* **42**: 7-23.

BRUYNS, P. V. 1988. A note on *Aloe* in the Brandberg, Namibia and an unusual hybrid. *Aloe* **25**: 24-26.

BRUYNS, P. 1990. New plant records from the Brandberg. *Cimbebasia* **12**: 161-166.

BRUYNS, P. V. 1992. Notes on *Euphorbia monteiroi*. *Aloe* **29**: 36-38

COLE, D. T. 1988. *Lithops flowering stones*. Acorn Books, Johannesburg. 1-254 pp.

CRAVEN, D. 1986. Last frontiers on the Brandberg. A tribute to Harald Pager 1923-1985. *Rossing Magazine* October 1986: 6-13.

CRAVEN, P. 1987. *Check list of plants collected on the Brandberg Mountain*. [unpublished manuscript].

CRAVEN, P. 1989. Brandberg flora - a short note. *Journal of the Mountain Club of South Africa* **92**: 96-97.

CRAVEN, P. (ed.) 1999. *Checklist of Namibian plant species*. Southern African Botanical Diversity Network, Report No. **7** SABONET, Windhoek, Namibia, [vi]+1-204 pp.

CRAVEN, P. 2000a. Additions and Corrections 1: C*hecklist of Namibian Plant Species. April 2000*. SABONET News 5:21-23.

CRAVEN, P. 2000b. Additions and Corrections 2: C*hecklist of Namibian Plant Species. August 2000*. SABONET News 5:102-103.

FRIEDRICH, H.-C. 1957. *Plumbago wissii* n. sp. (Dicot., Plumbaginaceae) ein charakteristischer Strauch der höchsten Gipfel des Brandberges in Südwestafrika. *Senckenbergiana biologica* **38**: 417-419.

FRIEDRICH, M. 1961. Eine neue *Hermannia* aus den Brandbergen. *Mitteilungen aus der Botanischen Staatssammlung. München* **4**: 167-169.

GERSTEL, D.U., BURNS, J.A. & BURK, L.G. 1979. Interspecific hybridizations with an Africa tobacco, *Nicotiana africana* Merxm. *The Journal of Heredity* 70:342-344.

GIESS, W. 1971. A preliminary vegetation map of South West Africa. *Dinteria* **4**: 5-114.

GIESS, W. 1982a. Weitere Neunachweise zur Flora des Brandberges. *Dinteria* **16**: 7-9.

GIESS, W. 1982b. Zur Verbreitung des Tabaks in *Südwestafrika*, *Nicotiana africana* Merxm. *Dinteria* **16**: 11-20.

HILLIARD, O. M. 1983. Asteraceae, Tribe Inuleae, subtribe Gnaphaliinae Part 1. *Flora of South Africa* **33**(7): 1-325.

HILLIARD, O. M. 1994. *The Manuleae. A tribe of Scrophulariaceae.* Edinburgh University Press, Edinburgh.

HILLIARD, O. M. 1999. *The tribe Selaginaceae.* Royal Botanic Garden, Edinburgh.

HILTON-TAYLOR, C. 1994. Karoo-Namib region: the Kaokoveld (pp. 201-203). In DAVIS, S. D. & HEYWOOD, V. H. (eds). *Centres of plant diversity: a guide and strategy for their conservation*. Oxford University Press.

IRISH, J. 1994. The biomes of Namibia, as determined by objective categorisation. *Navorsinge van die Nationale Museum Bloemfontein* **10**: 549-592.

JACOBSON, L. 1981. The Brandberg. *Rossing Magazine* December 1981: 8-11.

KINAHAN, J. 1991. *Pastoral nomads of the central Namib Desert. The people time forgot*. Namibian Archaeological Trust, New Namibia Books, Windhoek, 1-167 pp.

MAACK, R. 1923. Der Brandberg: ein Beitrag zur Landeskunde von Südwestafrika. *Zeitschrift Gesellschaft Erdkunde* 1-14.

MERXMÜLLER, H. (ed). 1966-1972. *Prodromus eine Flora von Südwestafrika.* Cramer Verlag, Lehre.

MERXMÜLLER, H. & BUTTLER, K. P. 1975. *Nicotiana* in der afrikanischen Namib - ein pflanzengeographisches Rätsel. *Mitteilungen aus der Botanischen Staatssammlung. München* **12**: 91-104.

MILLER, R. McG. 2000. Geology of the Brandberg Massif, Namibia and its environs. In KIRK-SPRIGGS, A. H. & MARAIS, E. Biodiversity of the Brandberg Massif, Namibia. *Cimbebasia Memoir* **9**.

MOISEL, L. 1982. Wanderungen in Brandbergmassiv, mit einem Nachtrag zur Pflanzenliste des Brandberges. *Dinteria* **16**: 21-26.

NORDENSTAM, B. 1967. New species of *Felicia* and *Pentzia* (Compositae) from the Brandberg, South West Africa. *Botaniska notiser.* **120**: 196-201.

NORDENSTAM, B. 1969. Phytogeography of the genus *Euryops* (Compositae). A contribution to the phytogeography of southern Africa. *Opera Botanica* **23**: 7-75.

NORDENSTAM, B. 1974. The flora of the Brandberg. *Dinteria* **11**: 3-67.

NORDENSTAM, B. 1982. The Brandberg revisited. *Dinteria* **16**: 3-5.

VOLK, O. H. 1966. Die Florengebiete von Südwestafrika. *Journal of the South West African Scientific Society* **20**: 25-58.

WALTER, J. 1972. Eine Brandberg-Besteigung Ostern 1972. *SWA Scientific Society Newsletter*. **13**: 2-7.

WALTER, J. 1979. Interessantes vom Brandberg. *SWA Scientific Society Newsletter* **10**: 1-2.

WALTER, J. 1980. Erlebnisse im südlichen Brandberg. *SWA Scientific Society Newsletter*. **11**: 2-9.

WHITE, F. 1983. *The vegetation of Africa.* UNESCO, Paris.

WISS, H.-J. 1957. Brandberg Expedition 1955. Ein Bericht ueber die gesammelten und beobachteten Pflanzen. *Journal of the South West African Scientific Society* **12**: 45-68.

Manuscript received

Appendix:
Since the publication of Nordenstam's 1974 list of Brandberg plants, the following taxa have been reviewed:

- *Sutera* cf. *atropurpurea* proved to *Jamesbrittenia huillana*, a widespread and extremely variable species and *S. canescens* was a misdetermination of the species now recognised as *J. chenopodioides* (Hilliard 1994).
- Balkwill & Balkwill (1988) split the *Peristrophe grandibracteata* complex and the new subspecies *Peristrophe namibensis* subsp. *brandbergensis* was proposed for the form known from the Brandberg
- In their revision of the genus *Hypoestes*, Balkwill & Getliffe Norris (1985) described the species *H. forskaolei* as being highly variable and widespread and recognised two distinct forms. They declined, however, to divide these further, until subsequent regional studies had been undertaken. Only a single specimen is known from the Brandberg (Nordenstam 2800).
- *Silene burchellii* has been identified as *S. pilosellifolia,* but as no Namibian specimens were examined during this revision, Nordenstam 2804 is in need of confirmation. Nordenstam's specimens represent the only collection of this species from the massif, these originating from the highest areas, where endemics and peculiar forms occur.
- Hilliard (1983) was unable to unravel the taxonomic complexities of *Helichrysum herniarioides*, but mentions a variant form with acute bracts and glabrous ovaries from the Erongo region. Nordenstam 3662 needs confirmation
- Bruyns (1990) includes Nordenstam 2837 and 3677 in *Adromischus schuldtianus* (Poelln.) Poelln. subsp. *schuldtianus,* but further indicated that both flat-leaved and fusiform-leaved forms occur sympatrically.

The following taxa are currently under review:

- *Cordia sinensis*
- *Cineraria canescens* (Craven 763, 2490)
- *Diclis petiolaris* (Nordenstam 2573)
- the *Lycium* genus
- specimens of *Tetradenia riparia* from the Brandberg which are considered to differ from the nominal form (P.B.Phillipson pers. comm.).
- *Lepidium divaricatum* (Nordenstam 2802) which may in fact represent *L. africanum* subsp. *divaricatum*

The following require taxonomic study:

- *Melhania* sp. (Craven 2482)
- *Rhynchosia* sp. (Craven 1336, 2761, 3142b) (possibly a form of *R. candida*)
- *Ruellia* = aff. *diversifolia* (Craven 2368)
- Craven 2266 (Convolvulaceae) from the basalt above the Sonusib
- a number of species of the genus *Salsola.*

Taxa previously recorded from the Brandberg, but removed as voucher specimens could not be traced, they have not been collected since and/or are considered doubtful or incorrectly identified.

Wiss (1957)
Aristida scabrivalvis Hack. (Poaceae)
Azima tetracantha Lam. (Salvadoraceae)
Burnatia enneandra P.Micheli (Alismataceae)
Combretum apiculatum Sond. subsp. *apiculatum* Exell (Combretaceae)
Cymbopogon excavatus (Hochst.) Stapf ex Burtt Davy (Poaceae)

Cyphostemma bainesii (Hook.f) Desc. (Vitaceae)
Cyphostemma congestum (Baker) Desc. ex Wild & R.B.Drumm. (Vitaceae)
Euphorbia lignosa Marloth (Euphorbiaceae)
Heteropogon contortus (L.) Roem. & Schult. (Poaceae)
Kedrostis foetidissima (Jacq.) Cogn. (Cucurbitaceae)
Mesembryanthemum crystallinum L. (Mesembryanthemaceae)
Sporobolus fimbriatus (Trin.) Nees (Poacaeae)
Stipagrostis obtusa (Delile) Nees (Liebenberg 5031) (Poaceae)
Tragus berteronianus Schult. (Poacaeae)
Tragus racemosus (L.) All. (Poacaeae)
Ziziphus mucronata Willd. (Rhamnaceae)
Salsola aphylla L.f., *S. arborea* C.A. Sm. ex Aell. and *S. tuberculata* (Moq.) Fenzl

Maarck (1923)
Listed plants appears to come from the Ugab and nearby foothills and some were incorrectly identified.
Arctotis stoechadifolia Berg. (Asteraceae) (probably *A. venusta* T. Norl.)
Argemone ochroleuca Sweet subsp. *ochroleuca* * (Papaveraceae)
Gomphocarpus tomentosus Burch. (Apocynaceae)
Nicotiana glauca R.C.Graham * (Solanaceae)
Steganotaenia araliacea Hochst. (Apiaceae)
Tarchonanthus camphoratus L. (Asteraceae)

Other doubtful records
Aloe asperifolia A.Berger (Asphodelaceae) (Nordenstam 1974) is at the base only.
Cyperus longus L. var. *tenuiflorus* (Rottb.) Boeck. (Cyperaceae) (Giess 1982)
Euphorbia giessii L.C.Leach (Euphorbiaceae) (Pager cf. 46)
Orthanthera albida Schinz (Apocynaceae) (Giess 1974)
Setaria appendiculata (Hack.) Stapf (Poaceae) (Giess 13320, Liebenberg 5021)
Tavaresia barklyi (Dyer) N.E.Br. (Apocynaceae) (Walter 1972)
Viscum menyharthii Engl. & Schinz (Viscaceae) (Moisel 1982)
Viscum schaeferi Engl. & K.Krause (Viscaceae) (Liebenberg 4986)
Wahlenbergia androsacea A. DC. (Campanulaceae) (Nordenstam 1974)

Table 1.
CHECKLIST OF VASCULAR PLANTS OF THE BRANDBERG

Key:
Vouchers: B= Bruyns; C= Craven; DeW= De Winter; G= Giess; H= Hardy; L= Lundgren; M= Merxmüller; N= Nordenstam; O,S & M = Oliver, Sreenkamp & Muller; P= Pager; W= Wiss;
Literature references or photographic records are indicated in brackets
Zone: height in metres; B= base of mountain;
Growth Form: A= annual; Aq= aquatic; C= climber; DW= dwarf shrubs; G= geophyte; H= herb; P= perennial; Par= parasite; S= shrubs; Suc= succulent; T= trees;
Distribution: E= endemic to Brandberg; N= endemic to Namibia; A= Angola; B= Botswana; C= Cape; S= southern Africa; Af= Africa; Afd= Africa disjunct; W= beyond Africa, wide or cosmopolitan;
Other:* = naturalised