

Swaziland



Titus S. Dlamini* & Gideon M. Dlamini*

Introduction

Swaziland has a human population of about one million and a total area of more than 17,000 km². The vegetation of Swaziland ranges from open grassland to forest, and from semi-arid savanna to wetlands. Owing steep gradients of climate, topography (altitude range is 90–1,862 m), and edaphic characteristics, the country's flora is extraordinarily rich. Swaziland is divided into four distinct physiographic zones, running from north to south: Highveld, Middleveld, Lowveld, and the Lebombo Plateau. Rainfall is highest in the Highveld and lowest in the Lowveld; most of the rain (about 85%) falls in summer.

The main authoritative work on the flora of Swaziland was undertaken by Compton (1976). Subsequent updates to this work have been compiled by Kemp (1981, 1983) and Braun (<http://www.sntc.org.sz/biodiversity/sdflora.html>). Although plant collecting for herbarium purposes has been taking place since the late 1800s, it has been sporadic. Braun & Dlamini (1994), therefore, emphasised that to conserve threat-

ened plant species in Swaziland, more field investigations need to take place and collecting intensity ought to be augmented. This was substantiated in an analysis of herbarium collections from two adjacent 25 km² grid cells—it was found that one contained 15 times more species than the other (1,177 compared to 87 species). This gross disparity was attributed to a higher collecting intensity in protected areas compared to unprotected areas in Swaziland (Braun & Dlamini 1994).

Although the country's knowledge of its indigenous flora is still at a developmental stage, current records indicate that there are over 3,400 species of higher plants in Swaziland, representing 771 genera in 135 families. The Swaziland National Herbarium (SDNH) holds about 7,450 specimens of higher plants.

Moreover, compared to the other southern African countries, Swaziland forms less than 1% of the land area, yet it contains almost 11% of the taxa recorded in the region. About 4% of the country is formally protected; the main focus is the conserva-

Capital: Mbabane, largest town

Area: 17,365 km²

Languages: English, Swazi (both official)

Currency: Emalangeni (E), on a par with South African Rand

Total plant species: 3,400

Total plant endemics: 12

Total RDL plants: 305

Focal RDL institutions: SDNH

Number of Protected Areas: six nature reserves managed by the SNTC, three managed by the Big Game Parks.

Population: 1,091,470 **Growth Rate:** 2.9% **Density:** 55.7 people/km²

Phytogeography: Predominantly Tonga–Pondoland Regional Mosaic, with Kalahari–Highveld Regional Mosaic in the west.

Flora: North Eastern Mountain Grassland to the west of the country with pockets of Afromontane forest merging eastwards into savanna scrub woodlands (mainly Sour Lowveld Bushveld, Sweet Lowveld Bushveld and Lebombo Arid Mountain Bushveld).

Sources: Anonymous 2000, Braun & Dlamini 1994, Low & Rebelo 1998, Stuart & Adams 1990, White 1983

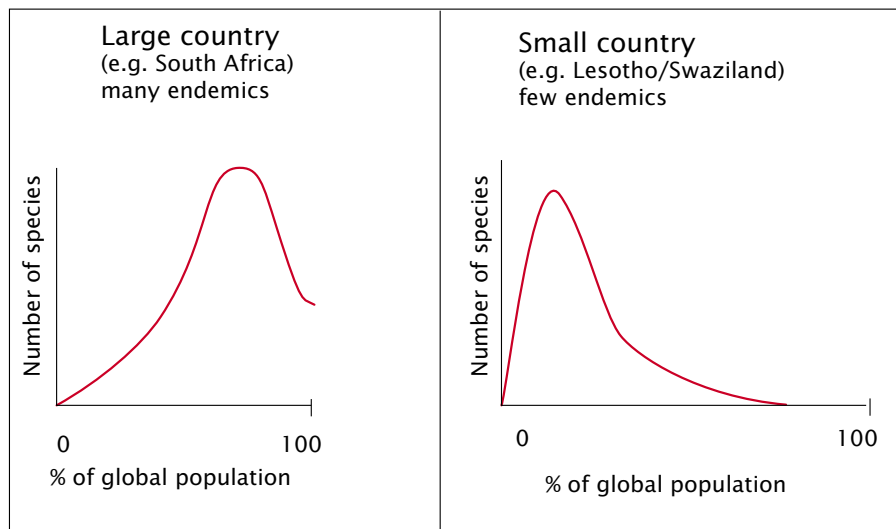


Figure 1. In a small country, most species tend to have a small share of the total global population of a species, whereas very few or none are endemic to the country (adapted from Gärdenfors *et al.* 1999).

*National Herbarium, Malkerns, Swaziland

Table 1. Number of taxa in each category on the Swaziland RDL.

RDL status	Number of taxa
Extinct (EX)	3
Extinct in the Wild (EXW)	1
Critically Endangered (CR)	15
Endangered (EN)	29
Vulnerable (VU)	18
Lower-Risk near threatened (LR-nt)	16
Lower-Risk least concern (LR-lc)	68
Data Deficient (DD)	155
Total	305

tion of fauna, but plants do enjoy a high level of protection in reserves. Much of the biodiversity is on Swazi Nation Land (under traditional leadership) and on Title Deed Land (under private ownership).

Methods

Hilton-Taylor’s (1996a) work formed the basis for this RDL. Our objective was to subject the “1996 RDL taxa” to a wide audience for re-assessment, to integrate new data, and to evaluate the conservation status of additional species. In addition to information in Hilton-Taylor (1996a), herbarium specimen data from PRECIS, PRE, SDNH, and databases belonging to Kate Braun were used as complementary starting points for making raw estimates (see Golding & Smith 2001). Herbarium collections by Braun, Compton, Culverwell, Dlamini, Dyer, and Kemp, to name but a few, also provided useful data. As there are many undercollected areas in Swaziland, we also relied on field observations of workshop participants to supplement recorded information. Additional taxa for RDL assessments were sourced from recent Environmental Impact Assessment studies.

The working approach adopted for the compilation of this RDL was to bring together botanists who work across the country to enable them to share their experiences relating to field observations and gen-

eral botanical knowledge. Three workshops were held between September 2000 and March 2001.

During the first workshop, the participants were familiarised with the IUCN RDL system of categories and criteria (IUCN 1994) so that a common understanding of their application could be reached. The IUCN 1994 Categories and Criteria were used to assess the conservation status; principles by Gärdenfors *et al.* (1999) served as a guide for assigning RDL categories at a national level for a country as small as Swaziland. Compared to large-sized countries, small countries tend to hold a smaller proportion of the global distribution of species, and hence, are likely to have fewer species confined within its borders (Figure 1). Theoretically, this meant that virtually the entire flora of Swaziland could have been placed on the RDL based on a narrow distribution range. To prevent this, species with approximately 20% or less of their global range (or global population) within the political borders of Swaziland were excluded from the RDL assessment process. Exceptions were made in cases where a species was known to be utilised or of some charismatic value.

Results and Discussion

In total, 305 taxa appear on the RDL for Swaziland (Table 1). This is a very high

Table 2. The ten families with the highest representation on the Swaziland RDL.

Family	Number of taxa
Apocynaceae <i>sensu lato</i>	31
Asteraceae	27
Lamiaceae	22
Asphodelaceae	21
Fabaceae	14
Orchidaceae	13
Iridaceae	12
Crassulaceae	10
Euphorbiaceae	10
Gesneriaceae	10

Table 3. Endemism on the Swaziland RDL.

Endemism	Number of taxa
Confirmed endemic	12
Suspected endemic	7
Confirmed near-endemic	35
Suspected near-endemic	5
Total	59

number of species, considering the size of the country.

Red Data List

Some 66 taxa (22%) that appear on the RDL are threatened (CR, EN, and VU). More than 50% have been categorised as *Data Deficient*; this clearly underlines the need for future work, particularly because some of the categories could not be used owing to the quantitative nature of their requirements (see Braun & Dlamini 1994). This lack of information is a result of the fact that the bulk of these assessments are based on herbarium collections and the degradation of localities, rather than on solid field evidence for the impacts of threatening processes on population decline. Herbarium data from PRECIS were sometimes found to be unreliable—often there were no records from Swaziland, or if there were, they were either single or poorly known. However, supplementing PRECIS information with other herbarium data sources held in Swaziland was very useful.

The main families represented on the RDL are the Apocynaceae, Asteraceae, Lamiaceae, and Asphodelaceae (Table 2). Most of these taxa are utilised for medicinal and ornamental purposes. The figures also reflect on how well-known these families are in terms of their representation in herbaria and the literature.

Another bias we encountered was the disparity between protected and unprotected areas. We found that the most reliable field records came from Malalotja and Mlawula Nature Reserves, and to a lesser extent, from other protected areas. Malalotja and Mlawula, which have a combined land area of 2% of the size of Swaziland, collectively contain 60% of all the species recorded in Swaziland (Braun & Dlamini 1994). The reason for this disparity is that more taxonomic and ecological studies have been carried out within protected areas than outside the protected area system.

Moreover, most endemics and near-endemics come from the Swaziland border areas of the Lebombo Mountains (KwaZulu-Natal) and from Barberton (Mpumalanga), as well as elements of the Maputaland Centre of Endemism, which Swaziland shares with Mozambique and South Africa (KwaZulu-Natal). Kemp (1983) recognised only four country endemics for Swaziland, whereas Braun & Dlamini (1994) estimated that there are at least 25 species (Table 3). It is our view that true levels of endemism will only be determined through field surveys along the Swaziland border, particularly the Lebombo Mountains, and that this be coupled with taxonomic activities.

Threats

The following key threats to the flora of Swaziland are recognised, though they are not formally documented for the country:

- Destruction or alteration of habitats through infrastructural development (urbanisation) and vegetation-clearing for food crops (maize, sorghum, and beans).
- Invading exotic species such as *Lantana camara*, *Sesbania punicea*, and *Chromolaena odorata* displace indigenous species and certainly have an effect on RDL species. Unfortunately, the ecological impact of alien invaders on threatened species in Swaziland has not yet been scientifically studied.
- Increasing human settlement owing to population expansion.

Conservation Legislation

Recently, the country has established the Swaziland Environmental Authority, a national body responsible for overseeing environmental protection. There are several legal instruments that cater for conservation issues residing in different government departments, but most of these legal structures are outdated. The Government of Swaziland is revisiting legislation, and the Flora Protection Bill of 2000 has been signed by His Majesty the King and turned into law. The Flora Protection Act of 2001 lists 206 protected plant species.

The Swaziland RDL is expected to work hand in hand with these legal instruments, which are expected to safeguard plant biodiversity. The Swaziland Environmental Authority Act of 1992 stipulates that prior to commencement of major development projects an Environmental Impact Assessment (EIA) should be carried out

and proper mitigation measures should be guaranteed. The Act further calls for special attention to be given to plants of high conservation status in the EIA studies. This updated RDL will enable the enforcement of this requirement. Therefore, within the above-stated legal framework, Swaziland finds herself in a favourable position to enforce the RDL.

Conclusion

The RDL account presented here is far more comprehensive than previous attempts. This is a result of consultation with relevant stakeholders, who must be commended for their dedication and effort.

Owing to the dynamic nature of species losses, this work is not final and the RDL will certainly undergo future changes. However, we emphasise that this RDL is an additional and useful document for the

Flora Protection Act, as it will enable closer monitoring of Swaziland's flora. To make this a reality, formal field studies on plant community structures, population dynamics, and utilisation patterns of plant species of commercial value have to be carried out in future.

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Participants at the Red List workshop in Mbabane. (Photo: J.S. Golding)



Invasive alien encroachment constitutes a major threat to biodiversity in Swaziland. (Photo: J.S. Golding)