

The conservation of *Aloe polyphylla* endemic to Lesotho

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ABSTRACT

Aloe polyphylla Schönl. ex Pillans, the spiral aloe, has been declared a protected species in Lesotho since 1938, yet the plant has been declining in number. Since then changes have taken place, including accelerated road building programmes, which make the problem of conservation of the species in its natural habitat even more acute. Problems connected with this rare species are discussed. It is concluded that, whereas measures initiated show some success, much more needs to be done.

RÉSUMÉ

LA PROTECTION DE L'ALOE POLYPHYLLA ENDÉMIQUE AU LESOTHO

L'*Aloe polyphylla* Schönl. ex Pillans, l'aloë spiralé, a été déclaré espèce protégée au Lesotho depuis 1938, et cependant la plante a continué à décliner en nombre. Depuis lors, des changements sont survenus, incluant des programmes de constructions routières accélérés qui rendent le problème de protection de l'espèce dans son habitat naturel de plus en plus aigu. Les problèmes inhérents à cette espèce rare sont discutés. En conclusion, bien que les mesures prises montrent un certain progrès, il reste encore beaucoup à faire.

INTRODUCTION

Aloe polyphylla Schönl. ex Pillans, the spiral aloe, called lekhalakhare and lekhalala-kharatsa in Sesotho, was first collected by F. H. Holland on Phurumela (Furumela) Mountain in November 1915. The material was sent to Schönland of the Albany Museum, Grahamstown, who drew up a description in January 1923 naming the plant *A. polyphylla*, but the description was never published. In 1934 Pillans published a description using Schönland's MS name and basing his description on Schönland's notes as well as photographs and material collected by Reynolds from Phurumela in September 1934.

The spiral aloe is unique to Lesotho and has not been found growing naturally outside Lesotho's borders. The plants are distinctive with five ranks of leaves that are coiled in either a left-handed or a right-handed spiral and have been much sought after by plant enthusiasts. The restricted distribution and the sale value of the spiral aloe have resulted in a serious depletion of the number of plants, causing its name to appear in the International Union for Conservation of Nature (IUCN) Plant Red Data Book (1978) as a vulnerable species. It is, moreover, included in Appendix 1 of the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora.

The Government of Lesotho has in recent years given high priority to road building, with a number of road projects specifically aimed at providing improved communications in the remote mountain areas. The remote mountain areas are also the home of *A. polyphylla*. As the hitherto remote areas become accessible, the spiral aloe sites also come within easier reach, and are therefore rendered more vulnerable. The matter of protecting this very distinctive aloe of Lesotho is now an urgent one.

Beverly (1978) estimated the spiral aloe population to be around 3 000 plants. The known distribution is shown in Fig. 2.

CONSERVATION PROBLEMS

Plants removed from their natural habitat are difficult to grow. Gardeners often kill them by overwatering or by not watering them at all. They grow slowly and their fruits frequently get damaged by insects. The seeds that survive do not germinate if conditions are not right and the seedlings may show frost sensitivity (Beverly, 1977). The problems of maintaining a spiral aloe population are not only those of law enforcement, but also a lack of knowledge of the plant's life cycle and ecology.

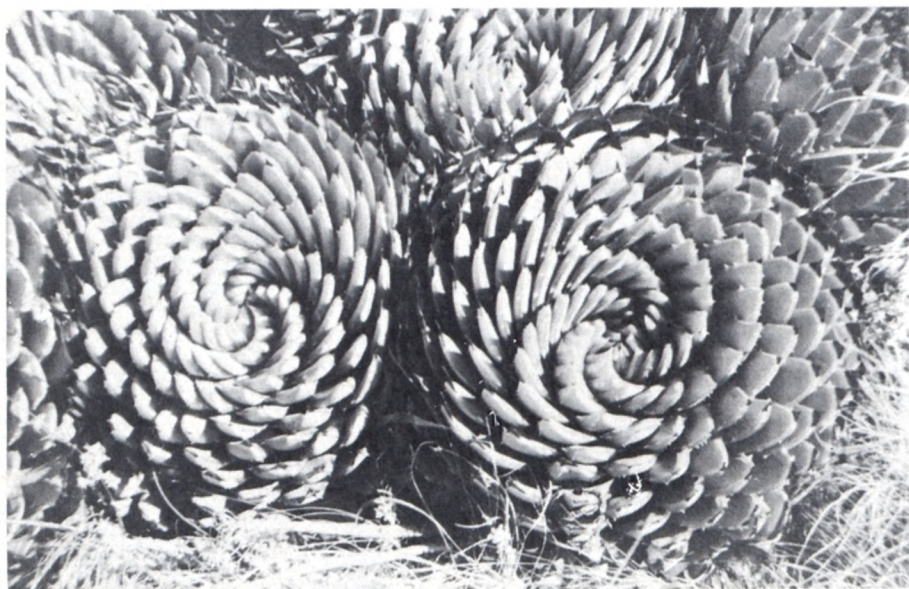
The problem of conservation of *A. polyphylla* is being tackled in three ways: by legislation, publicity and education, and by the raising of plants in an authorised nursery in Maseru. These programmes have not been as effective as they might be because of a lack of enough trained people to carry them out. Enforcement also needs its own budgetary provision.

LEGISLATION

Aloe polyphylla was declared a protected plant by a Proclamation issued by the Resident Commissioner of Basutoland on the 20th September 1938, prohibiting its removal, export, sale or destruction. This Proclamation was repealed and replaced by the Historical Monuments, Relics, Fauna and Flora Act, Act 41 of 1967 of Lesotho Government.

Act 41 of 1967 made provision for a Commission for Preservation of Natural and Historical Monuments, Relics and Antiques and the Protection of Fauna and Flora (Section 3). This commission known as the Protection and Preservation Commission (PPC) was given the tasks, 'subject to the provisions of this Act, generally of performing all such acts as are necessary for or incidental to the

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FIG. 1.—*Aloe polyphylla* in situ.

carrying out of the function and duties under this Act'.

On the advice of the PPC, the Minister of Education later issued a Legal Notice (No. 36 of 1969) where the Monuments, Relics, Protected Fauna and Flora in Act 41 were defined. The first item in the schedule of protected flora is concerned with aloes and *A. polyphylla* and its seeds and flowers are specifically mentioned.

FIELD EVIDENCE OF STATUS OF SPECIES

Evidence for the current status of the species from four fieldsites that have been monitored by various workers is given here. The type locality given by Reynolds (1950) is the western slope of an area known as Phurumela (Furumela), 50 km east of

Maseru. This locality, quite close to a large trading store linked to the lowlands by road, was visited in 1958 by Schmitz who found a large number of aloes, but did not count them. In 1966 Ambrose (pers. com.) counted 293 plants at a lower site near a village, and 116 plants at an upper site near the mountain summit. When he went back there in 1973, no spiral aloes were left at the upper site. Schmitz was told in 1972 that two lorries full of *A. polyphylla* had been sold to 'a European'. Beverly also declared this site extinct in 1977 and could not find any evidence of regeneration from seeds that may have fallen on the ground from mature plants, long since removed or destroyed. The depletion of aloes from this site was noted by one of the sisters in the hospital at Roma, who knows this area well. At the lower site, *A. polyphylla* enjoys the protection of the village headman who is well aware that they have a cash value. According to Beverly, plant numbers were reduced to 102 by 1977.

Another site, within motorable distance from Maseru and close to the Mountain Road, is also extinct. Visitors to Lesotho often take the spectacular drive into the mountainous interior of Lesotho up the Mountain Road, and have been offered spiral aloes for sale (Jacot Guillarmod, 1975). Some plants from here and from the type locality mentioned earlier may have found their way to the National University, where newly arrived staff members would buy this beautiful aloe, not knowing that they are protected. Recently, however, the number of sellers (Fig. 3) has decreased, presumably because the law prohibiting the sale of spiral aloes has become widely known, and also because there are so few left. The lifting of these plants for sale has by no means stopped, even now. Someone from Europe was sold one in Maseru in October 1980, shortly after arrival.

Other former sites, now exhausted, were similarly located within short distances from roads or motorable tracks, and stories of plants being carried away from hillsides on donkeys in sacks for transportation by lorry out of Lesotho are not uncommon. Beverly (1977) observed certain wanton

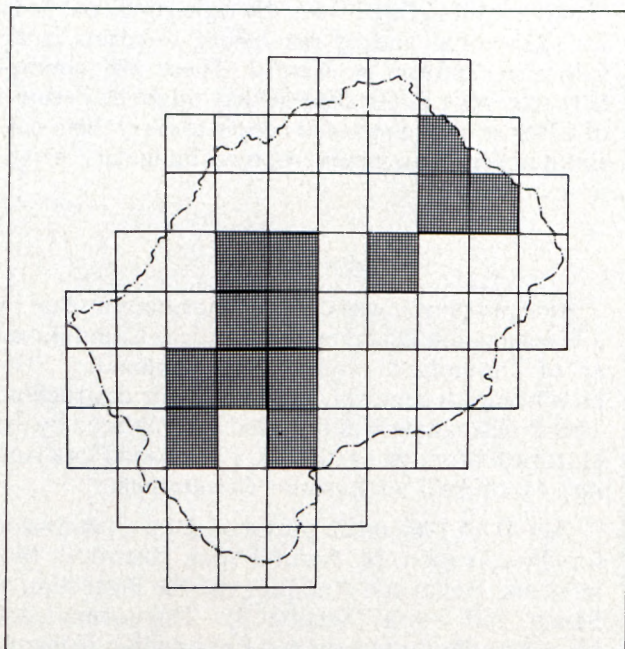


FIG. 2.—Known distribution of *Aloe polyphylla* within Lesotho. Each shaded quadrangle contains one or more confirmed sites. Data from Ambrose (pers. com.) & Beverly, 1978.



FIG. 3.—*Aloe polyphylla* on offer for sale at Roma, 1966. At the time, several sites now extinct were within walking distance of Roma. The women transport aloes on their heads, one at a time.

destruction as well. At a locality in Quthing district having 232 plants, 35 had been uprooted, some plants having been rolled down the hillside by herdboys and the inflorescence had been knocked off most plants. The result was that there were no seeds or seedlings. Such vandalism threatens the very existence of the species. The construction of the Southern Perimeter Road will have begun by mid-1981. It will pass through this area and the site will be further threatened.

One of the larger sites within easy reach by vehicles from the national capital, Maseru, has been kept under observation since 1976. The numbers counted by different observers are given in Table 1.

As observed by Ambrose and Talukdar, many plants had divided into a left-handed and a right-handed spiral, each of which produced a scape, or sometimes the scape arose from the point of division. In one case the scape arose at a point where the cheirality reversed in a single plant. The scape usually had 5–7 branches, but in one clump a plant with 14 branches was observed.

The number of plants is probably declining because of the removal of young plants from this

site. There appears to have been no regeneration from seeds in the last three years. However, it must be remembered that November 1980 was very dry in Lesotho.

Flowers were at their best in early November, but some continue flowering up to a month after that (Fig. 6). (Cultivated plants occasionally flower for a second time in February–March.) Malachite sunbirds were observed sipping nectar from the long tubular flowers. Bees and hover flies also assist in pollination.

CONSERVATION STRATEGIES

Legislation, publicity and education

The Protection and Preservation Commission issued a Public Notice circulated in Lesotho in April 1970 prohibiting the removal and/or export of *Aloe polyphylla*. Authority to remove the spiral aloe can only be obtained from the PPC, and such permission will only be given for genuine educational or scientific purposes and not for commercial or other purposes.

TABLE 1.—Plant and seedling counts at one of larger sites of *Aloe polyphylla* in Lesotho

Year	Observer	Adult plants	Seedlings
1976	Beverly	300	10 (Schmitz)
1977	Schmitz	394	2
1977	Beverly	collected seeds	0
1979	Schmitz	was able to count on one face only; number was unchanged	0
1980	Ambrose & Talukdar	373 no young plants less than 40 cm in diameter; the largest plants were up to 110 cm in diameter	0

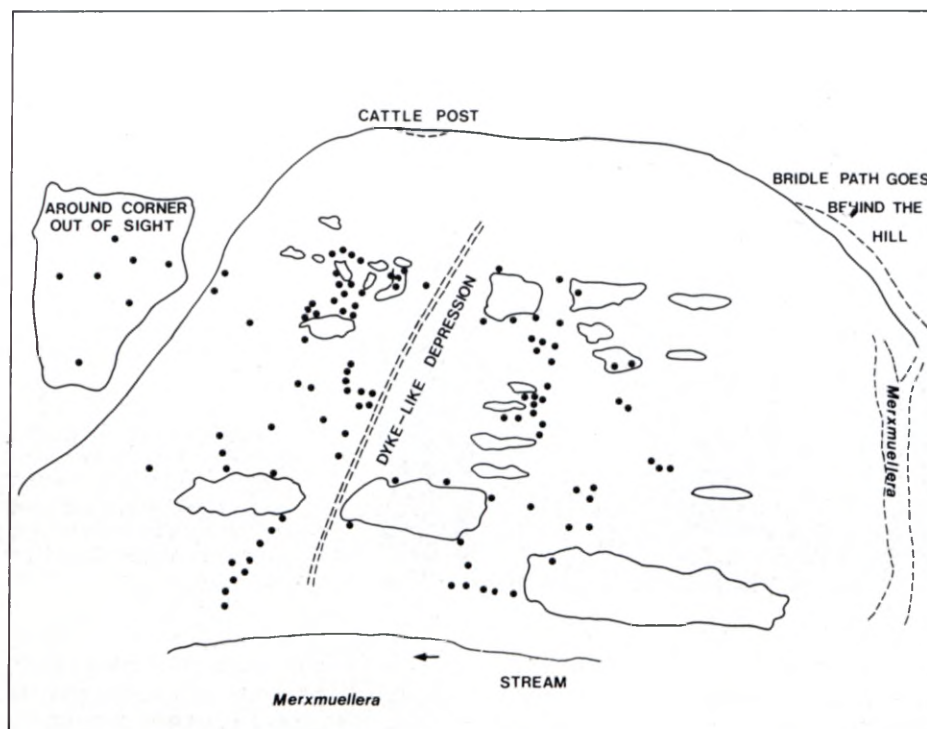


FIG. 4.—Sketch of the site where spiral aloe census was taken. It is a steep hillside of NW aspect, 2 450–2 500 m above sea level. Rocky outcrops are outlined and *A. polyphylla* clumps have been marked with black dots. The number of aloes per clump was from 1 to 8, one had as many as 12. They grow almost down to a stream with abundant tussocks of *Merxmüllera* on both sides. The soil is basalt-derived.

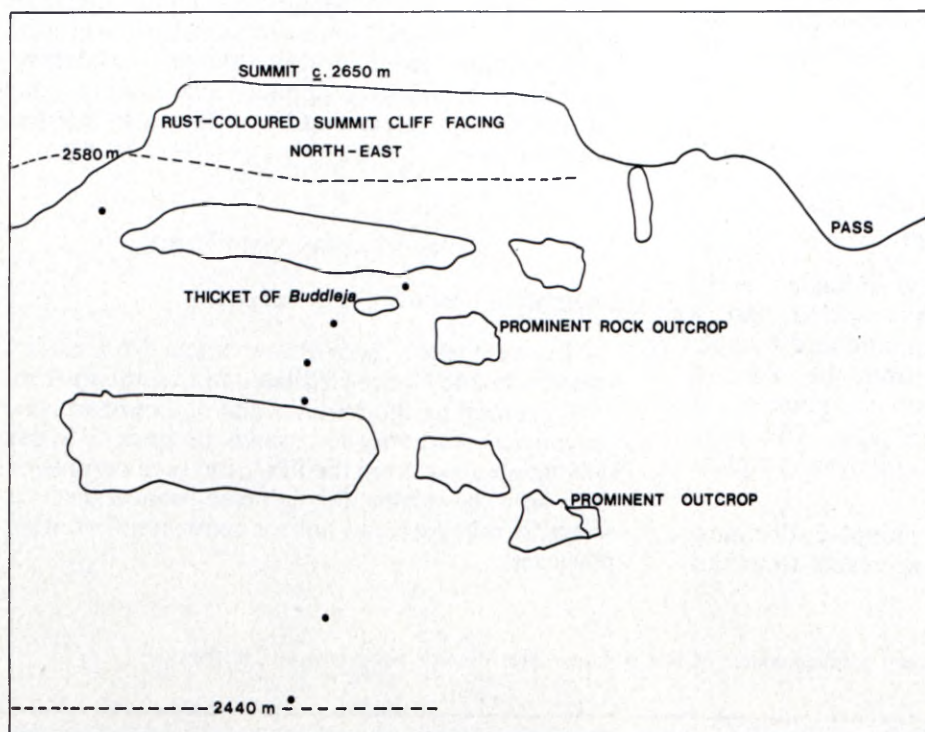


FIG. 5.—A smaller site with only 9 plants (altitude 2 450–2 550 m) seems to be a remnant protected by the steepness of the slope, and therefore inaccessible. There is a danger from intense grazing by goats and the destruction of soil cover. Black dot = *Aloe polyphylla* clump.

Act No. 41 of 1967 prescribed a fine of R200 or imprisonment not exceeding six months in default of payment (paragraph 12). Although many headmen and chiefs knew this, aloes continued to disappear. The PPC was concerned and decided that the protection of *A. polyphylla* should be one of its pilot projects (October 1968). A plan was drawn up with the following points:-

- (1) That the aloe is protected must be publicized in all possible ways and the police alerted.
- (2) Aloes removed without permission should be confiscated. The confiscated plants should be cared for in a safe place.
- (3) A nursery to raise aloes from seeds should be started. These plants could be sold legally thus taking the pressure off natural sites. Plants raised in the nursery could be used for restocking exhausted sites.

The PPC has sought to pursue these lines of action, but it is handicapped by having no field

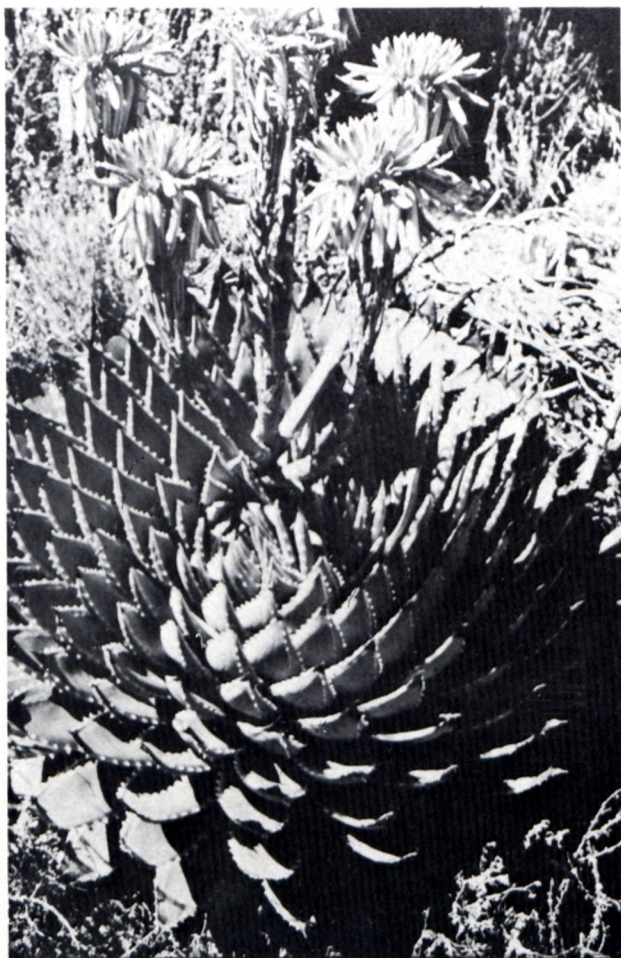


FIG. 6.—*Aloe polyphylla* flowering.



FIG. 7.—Association of *A. polyphylla* seedling in its natural habitat with *Euphorbia clavarioides*.

ACKNOWLEDGEMENTS

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workers. The members hold full-time jobs elsewhere and can at the best, only advise. Unless there is an adequate budget and full-time field staff, these ideas cannot be implemented.

Aloe nursery

A nursery for spiral aloes was started in Maseru in 1977 by two officers of the Thaba-Bosiu Rural Development Project. It is now in charge of the Curator, Maseru Herbarium, in the Agricultural Research Division of the Ministry of Agriculture. Mrs Lerato Mohapi, the Curator, has successfully raised a number of spiral aloes from seed and has recently requested (1981) PPC's permission to sell some of these plants. In the process of growing them, much information has been gained on the growth of *A. polyphylla*. The physiology of seed germination would be an interesting research topic. The knowledge gained from this kind of research could be applied to solve the problems of restocking depleted sites. Its ecology under natural conditions, particularly its association with other plants (Fig. 7), will be another interesting line of investigation.

CONCLUSION

The conservation of spiral aloes is a matter of some urgency, and the measures initiated in Lesotho are showing some success, though much more needs to be done.