

**A review of the trade in *Aloe ferox*,
with a focus on the role of the
European Union**

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Amélie Knapp

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Aloe ferox growing in South Africa (David Newton, TRAFFIC East/Southern Africa)

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EXECUTIVE SUMMARY

Aloe ferox, the Cape Aloe or Bitter Aloe, is an endemic succulent plant native to South Africa and Lesotho. It is listed in Appendix II of CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora). The leaves of this plant are collected to produce bitters used in drinks and medicines, and for gels and creams used in skin and hair care products. The aim of this study is to describe and quantify the international trade in *A. ferox* since 1994, with a particular focus on the role of the European Union (EU). Besides an overview of current international trade in *A. ferox*, the trade data analysis carried out in this study aims to support the efforts of the relevant authorities in EU Member States in assessing their current importing and re-exporting practices in the EU in order to ensure that this trade is carried out according to obligations set in the EC Wildlife Trade Regulations.

A. ferox is reported to be exported from South Africa in many different forms, of which the main ones, using CITES terms, are extract, derivatives, dried plants, leaves, timber¹, stems and live plants. Lesotho has never reported exporting any specimens of this species. South Africa reported exporting *A. ferox* extract to 24 countries between 1994 and 2003 but of these, only seven have reported importing extract from South Africa. Between 1994 and 2003, South Africa reported exporting a total of over 3000 tonnes (t) of *A. ferox* extract, with an annual average of 348 t. However, according to importer records, the total imports of extract from South Africa were only half of this amount. Overall, reported South African exports of *A. ferox* extract fluctuated between 1994 and 2003 with a peak in 1995 at 518 t. South Africa's reported exports of extract were on average higher in 1994-2003 than they were in 1981-1994.

The largest importers of extract based on South Africa's reported trade were, in order of decreasing importance; Germany, the UK, Italy and Japan. Over 75% of South Africa's exports of *A. ferox* extract were imported by EU Member States, as well as the entirety of South Africa's exports of dried plants and leaves, and the majority of derivatives and stems. The vast majority of South Africa's exports of extract to the EU were from wild plants. It appears that there is a large market for *A. ferox* extract in the EU, with only 34% of reported exports of extract to the EU reported as having been re-exported outside the EU. However, given the apparent lack of reporting on trade in *A. ferox* by certain countries highlighted in this report, it may be that more than 34% of the extract imported into the EU is being re-exported, either as extract or after being processed into final products, but that the countries involved are not reporting all of their re-exports. The main countries outside the EU to which EU Member States reported re-exporting extract were, in order of importance: the USA, the Republic of Korea, Argentina and Brazil.

As well as reporting re-exporting *A. ferox* extract, EU Member States also reported re-exporting, to a lesser extent, some dried plants and derivatives. Some artificial propagation of *A. ferox* takes place in the EU, but all exports of artificially propagated *A. ferox* from EU Member States consisted of live

¹ The term timber refers to sections of dried hollow stem that are often used in the dried flower trade

plants, suggesting that *A. ferox* is cultivated in the EU to be traded for ornamental rather than for medicinal purposes.

This report demonstrates that there are substantial discrepancies between exporter and importer reports for trade in *A. ferox* parts and derivatives, both amongst EU Member States and globally, which leads to very imprecise estimates of the actual trade and hence makes it impossible to use international trade data to assist in assessing the sustainability of this trade. Discrepancies between importer and exporter records for CITES trade data are not uncommon. Given that South Africa bases its CITES annual reports on permits issued rather than actual trade, this may lead to over reporting of trade if permits are issued but never used. However, it is unlikely that the extent to which exporter records exceed importer records for *A. ferox* can be explained by this alone and it is likely that some importers are under-reporting on their imports from South Africa, or not reporting on these at all. A number of EU Member States such as Austria, Denmark, the Netherlands and the UK have not reported any imports from South Africa whereas South Africa has reported exporting many tonnes of extract to those countries.

Given the increase in reported trade for 1994-2003 compared to the period 1981-1994, the status and management of *A. ferox* should be reviewed to try and determine whether current harvest levels are sustainable; this will be undertaken in the coming year as part of the CITES Significant Trade Review Process.

Based on the findings from this report, the following recommendations are made:

- The European Commission should remind EU Member States about the obligation to report imports of *A. ferox*, and other Appendix II plants, in whatever form the plants, their parts or derivatives are imported (unless exemptions apply);
- Where discrepancies occur between EU Member States' and South Africa's reported trade in *A. ferox*, Member States should provide information, where possible, to the European Commission if any applications for import permits have been received and clarify why there is no reporting on actual imports or why they are reporting lower imports than South Africa reports exporting them;
- EU Member States should liaise with South Africa to obtain details of EU importers of *A. ferox* and clarify why these importers are not applying for import permits;
- Exporters (including re-exporters) and importers should standardize the terms and units of measurement used when reporting trade in *Aloe ferox*, e.g. using grammes and kilogrammes rather than litres and millilitres, to enable more accurate estimates of trade volumes.

INTRODUCTION

Species description and use

Aloes are succulent plants and the genus *Aloe* includes over 500 species and sub-species which are concentrated in southern and eastern Africa and Madagascar. Although all *Aloe* species share a characteristic leaf structure, aloes range from miniature plants only a few centimetres high, to the 20 m tall “tree aloes”. For hundreds of years, people have used the juices contained within the leaves of some species of aloe for both medicinal and cosmetic purposes. Aloe bitters are used traditionally as a laxative or purgative, to combat arthritis, and in veterinary medicine. Aloe species are also grown as ornamental plants (McGough *et al.*, 2004).

The main species used to produce the drug aloes is the Cape Aloe or Bitter Aloe *Aloe ferox* Mill, also known under the synonyms *Aloe horrida* Haw and *Aloe socotorina* Masson (Lange, 1999). *A. ferox* is a large arborescent perennial shrub with a single stem two to three metres in height (Anon., 1985) which produces a single candelabrum-like inflorescence with dense erect spikes of scarlet flowers from May to October (Botha *in litt.*, 1992 in Newton and Vaughan, 1996). Individual specimens have an estimated life span of 150 years (Newton and Vaughan, 1996).

Although one of its German common names is Gefährliche Aloe (Dangerous Aloe) (Table 1), *A. ferox* is believed to be good for human health. The leaves of this plant are collected to produce the bitters used in drinks and medicines, and for gels and creams used in skin and hair care products. The main plant derivatives used are concentrated and solidified juices of *A. ferox* leaves (Lange, 1999).

Table 1

Pharmaceutical names, in different languages, under which *Aloe ferox* is traded

Pharmaceutical name	Language
Aloe capensis, Aloe lucida, Aloe	Latin
Cape Aloes, Lucid Aloes	English
Aloès du Cap	French
Áloe	Spanish
Lu hui, Tou ming lu hui	Chinese
Kap-Aloe, Bitter-Aloe, Berg-Aloe	German
Aloë del Capo	Italian
Rokai, Aloe	Japanese
Nohwa	Korean

Source: Lange (1999).

Distribution, abundance and status

Aloe ferox is native to South Africa and Lesotho, and is the only species used in South Africa for the extraction of bitters and aloe gels (Newton and Vaughan, 1996). According to Botha (*in litt.*, 1992 in Newton and Vaughan, 1996), *A. ferox* is South Africa's main commercial aloe species. The distribution of *A. ferox* extends from the Swellendam district in the Western Cape Province, through the Eastern Cape Province, southern Lesotho and into southern KwaZulu-Natal (Newton and Vaughan, 1996). *A. ferox* occurs in habitats ranging from easily accessible valleys to inaccessible mountain ridges, which ensures the survival of the species in the wild even if agricultural development has decreased its range on arable lands (Newton and Vaughan, 1996).

A. ferox is very common from the Cape to southern Natal and is probably the most common aloe species in South Africa (Oldfield, 1993) but the actual population size is unknown (Anon., 2006a). In 1989, the wild population of *A. ferox* was estimated to be distributed over an area of more than 10 000 km² (Donaldson, 1989). In the Eastern Cape, *A. ferox* is reported to be a very common species that is not threatened. In KwaZulu-Natal, the species is considered to have very large population sizes and not to be threatened. The species is not listed as endangered within the Northern Cape Province (Anon., 2006a). In the Western Cape, the population of *A. ferox* is not believed to have declined in the last ten years and this species is still very common and therefore specifically not listed as a protected species in the Western Cape Province (D. Hignett, Western Cape Nature Conservation, pers. comm., 4 April 2006).

A. ferox does not seem to be particularly vulnerable based on the information available in 1989 (Donaldson, 1989) and it is not currently listed in the IUCN Red List of Threatened Species² 2006 (Anon., 2006b). However, although the harvesting of leaves does not kill the plant, there has been concern that leaf harvesting may affect growth, reduce flowering, and reduce resilience to drought (Donaldson, 1989).

The species is widely cultivated for its ornamental properties (Oldfield, 1993) and propagates with ease, with plants reaching maturity (flowering stage) within four to six years (Botha *in litt.*, 1992 in Newton and Vaughan, 1996). Commercial plantations of *A. ferox* have been started at Albertinia, South Africa (Newton, 1993).

² The IUCN Red List of Threatened Species provides taxonomic, conservation status and distribution information on taxa that have been globally evaluated using the IUCN Red List Categories and Criteria. The only taxonomic groups of plants, that have been comprehensively assessed, are the conifers and cycads.

National legislation and international trade controls

Twenty-two *Aloe* species are listed in CITES Appendix I. The remainder of the genus, excluding one species, *A. barbadensis* Miller (Syn. *A. vera* (L.) Burm. f.), is listed in Appendix II³. *A. ferox* has been listed in Appendix II since 1975 and it is listed in Annex B of the EC Wildlife Trade Regulations.

At present, in South Africa, the only regulation of harvest of *A. ferox* is in terms of provincial ordinances. *A. ferox* is not classified as a protected plant in terms of *Eastern Cape Nature Conservation Ordinance*. In the Northern Cape, it is protected under *Northern Cape Nature and Environmental Conservation Ordinance No. 19 of 1974* (Anon., 2006a). In the Western Cape, the main relevant legislation is *the Western Cape Nature Conservation Laws Amendment Act 2000*. The *National Environmental Management – Biodiversity Act 10 of 2004* will very shortly, upon enactment of enabling regulations, become the main regulatory tool at a national level. This Act covers all aspects of management and includes the full enactment of CITES provisions in South African law.

Management

In 1993, Cape Nature Conservation (now CapeNature) considered the *A. ferox* industry to be small and not a significant threat to the survival of *A. ferox* populations and their policy, therefore, was not to interfere (Burgers, pers. comm., 1993 in Newton and Vaughan 1996). The aloe industry, in 1996, was not subject to a formal management strategy in South Africa (Newton and Vaughan, 1996) and currently, in the Western Cape Province, it is still the case that there is no specific management strategy for this species (D. Hignett, Western Cape Nature Conservation, *in litt.*, 7 April 2006).

Although some officials have stated that population monitoring of *A. ferox* is essential, little formal population monitoring has been carried out by government organisations or non-governmental organisations (NGOs) (Newton and Vaughan, 1996) and no population studies have been carried out to make a CITES non-detriment finding (Anon., 2006a). In the Western Cape Province, no specific monitoring is carried out for *A. ferox*, although general monitoring of biodiversity in certain areas will provide information about *A. ferox* (D. Hignett, Western Cape Nature Conservation, *in litt.*, 7 April 2006). Plants are harvested on an 18-month to three year cycle and although the removal of leaves does not normally kill *A. ferox* plants, the impact of harvest on the life span of this species is unknown and may be detrimental to the survival of harvested plant populations in the long term (Newton and Vaughan, 1996).

³ With the following annotation: #1. Designates all parts and derivatives, except:
a) seeds, spores and pollen (including pollinia); b) seedling or tissue cultures obtained *in vitro*, in solid or liquid media, transported in sterile containers; and c) cut flowers of artificially propagated plants;

Trade

There are currently no export restrictions for *A. ferox* from South Africa other than those associated with CITES.

Aloe “bitters” refer to sap collected from harvested leaves, which can be processed into either a crystalline or powdered form (Newton and Vaughan, 1996). Commercial exploitation for bitters and the production of gels causes the main pressure on this species (Anon., 1998). The aloe tapping industry in South Africa is mainly an export industry with little secondary or tertiary processing occurring in the range State (Newton and Vaughan, 1996) although in recent years, the level of in-country processing has reportedly increased (D. Hignett, Western Cape Nature Conservation, pers. comm., 4 April 2006). Both bitters and gels tend to be reported in international trade under the CITES trade terms “extract” (which refers to raw material) or less frequently “derivatives” (which refers to finished, packaged products) (J. Caldwell, UNEP-WCMC, pers. comm., 28 March 2006). In the mid-1990s, the domestic demand for aloe bitters remained limited and domestic sales of commercially processed aloe products, other than bitters, in South Africa was slow because of competition with “Aloe vera” produced from *A. barbadensis* which has been on the market for longer (Newton and Vaughan, 1996). Currently, it is not known whether the domestic market for aloe bitters has increased.

A report on the *A. ferox* trade by Newton and Vaughan (1996) estimated that in the mid 1990s, the leaves of approximately 10 million plants were harvested annually to produce some 400 t of *A. ferox* bitters. This level of trade was considered to be sustainable, as only the leaves were harvested, the plant was relatively common, and a large section of the wild population was never subject to harvesting. However, in addition to the reported, legal trade, the report estimated that there was an illegal or undocumented trade of 300 t per annum (which appeared to originate from the Port Elizabeth area). Newton and Vaughan (1996) cautioned about the unregulated aspects of the industry as well as the fact that the South African Government had not conducted any form of sustainability assessment and added that this species needed to be studied further as well as safeguarded.

Although South Africa has one of the best documented trades in aloe products in the world, the country’s CITES annual reports have regularly excluded or misreported significant volumes of trade data (Newton and Vaughan, 1996).

Aim of the report

The status, management and manufacture of *A. ferox* as well as international trade in this species were reviewed in 1996, to investigate the sustainability of the South African *Aloe ferox* industry (Newton and Vaughan, 1996). The study used CITES import and export data from the CITES Trade Database, cross-checked with CITES import and export data from the South African CITES export permits on which the annual reports are based. In 1998, a brief update to the report was produced, analysing the

trade in *A. ferox* since 1994 (Anon., 1998). Although Newton and Vaughan (1996) concluded that *A. ferox* was being sustainably harvested, at the levels and within the industry structure observed at that time, they also concluded that the industry needs to be monitored and the species should be further studied and safeguarded. Since that study was conducted, the *A. ferox* industry is thought to have increased substantially (D. Newton, TRAFFIC East/Southern Africa, pers. comm., 19 November 2005). The aim of this study is to describe and quantify the international trade in *A. ferox* since 1994, with a particular focus on the role of the European Union. Besides an overview of current international trade in *A. ferox*, the trade data analysis carried out in this study aims to support the efforts of the relevant authorities in EU Member States in assessing their current importing and re-exporting practices in the EU in order to ensure that this trade is carried out according to obligations set in the EC Wildlife Trade Regulations.

METHODS

Data sources

A detailed analysis of the *Aloe ferox* industry in South Africa, including comprehensive trade data analysis, was conducted by TRAFFIC in 1996 (Newton and Vaughan, 1996). This provided the majority of the baseline data used in the present report. In addition, internet and literature searches were conducted for more recent information on *A. ferox* and, where appropriate, national and international experts were contacted.

CITES trade data (data provided by CITES Parties in CITES annual reports) were used to analyse reported international trade in *A. ferox* specimens. The trade data involving *A. ferox* for the years 1994 to 2003 (the most recent year in which comprehensive data are available) were downloaded in November 2005 from the CITES Trade Database, managed by UNEP-WCMC on behalf of the CITES Secretariat.

For the purpose of this report, comparative tabulations, which compare the imports and exports reported by individual CITES Parties, were used. Comparative tabulations include information on the reported purpose of trade and the source of the specimens traded. Although the trade records should be reported identically by the importer and the exporter, in practice, these often differ. Nonetheless, these data highlight the main export destinations, provide an indication of quantities in trade and of trends. For the core of the analysis in this report both importer and exporter data were used to enable a comparison.

In order to assess how levels of trade described in this report (1994-2003) compare with trade levels prior to 1994, trade data based on South African CITES export permits, covering the period 1981-1994, were taken from Newton and Vaughan (1996). These data are based on CITES annual reports for South Africa, for which omissions and inaccuracies stemming from South Africa's reports were corrected by Newton and Vaughan through checking entries permit-by-permit.

Trade data analysis

Unless specified otherwise, all CITES trade descriptions and totals include all sources (e.g. wild, artificially propagated) and purposes (e.g. commercial or scientific) for data from 1994 to 2003. CITES Parties often, but not always, use a term to describe a trade shipment, such as "live", "leaves" or "extract". *A. ferox* has been exported in many different forms and reported using different terms and units (e.g. kilogrammes of derivatives or litres of extract) so where possible, these units were standardised (grammes converted to kilogrammes and millilitres to litres). It is very difficult to convert one term into another though, and therefore it is not possible to obtain a single estimate for the total

amount of *A. ferox* traded. Because South African reported exports were largely dominated by extract, this term was used for the majority of the analysis.

Although the EU grew from 12 to 15 Member States over the period studied (1994-2003), and has subsequently expanded to 25 Member States (in 2004), the analysis includes all 25 current EU Member States for the whole period, in order to assess the role of the current EU over time.

Most of the analysis involved only direct exports from South Africa and excluded re-exports (exports from a country where the specimens did not originate), as direct exports from a country of origin are more relevant when assessing the level of extraction of plants from a country's population and the impact of trade on a population.

RESULTS

Global trade

Between 1994 and 2003, South Africa reported exporting 155 species of *Aloe*, but only *A. ferox* was reported to be exported as extract or derivatives, suggesting that this remains the only *Aloe* species in South Africa which is used for the collection of extract on a commercial basis for international trade. The other *Aloe* species were mainly exported from South Africa as live plants or seeds. Lesotho, the other range State for *A. ferox*, did not report any exports of this species (1994-2003).

A. ferox was reported to be traded in many different forms (CITES trade terms), of which the main ones were extract, derivatives, dried plants, leaves, timber, stems and live plants (**Table 2**). For most of the terms listed in **Table 2**, reported exports exceeded reported imports.

Table 2

Total reported exports of *Aloe ferox* from South Africa categorised by term and unit, according to South Africa and according to importers (1994-2003).

Term	Unit ²	Quantity reported by South Africa as exports	Quantity reported as imported by recipient countries
Bark	Kg	1 400	
Bark	Inches	97 340	
Carvings		97 821	
Cultures		1 000	
Derivatives		154 233	1 562
Derivatives	Kg	105 123	5 083
Derivatives	Litre	78 835	47 520
Dried plants		33 000	44 813
Dried plants	Kg	210	
Dried plants		11 032	
Extract		32 761	35 791
Extract	Kg	3 130 374	1 424 013
Extract	Litres	165 243	86 195
Extract	Cans	220	
Fibres	Kg	49	
Flowers		880	
Leaves		6 500	
Leaves	Kg	5 638	
Live		27 887	36 818
Live	Kg	2 500	
Powder	Kg	49 761	100
Powder	Litre		45
Roots			480
Seeds		152	20
Stems		85 285	31 772
Stems		13 445	
Stems	Kg	2 300	
Timber ¹			24 325
Timber ¹	Kg		8 312
Timber pieces ¹		206 192	
Timber pieces ¹	Kg	9 043	
Wax			248

Source: Adapted from CITES trade data compiled by UNEP-WCMC, Cambridge, UK.

¹The terms timber and timber pieces generally refer to sections of dried hollow stem that are often used in the dried flower trade. ²Where no unit is specified, this refers to number of specimens.

Of the terms listed above (**Table 2**), extract reported in kilogrammes was by far the most traded form of *A. ferox*. Between 1994 and 2003, South Africa reported exporting over 3000 t of extract world-wide, although importing countries reported importing only about half this quantity from South Africa. It could be that importers are using a different term, such as ‘derivative’ to report on some of their imports of what South Africa reports exporting under the term ‘extract’. However, the total amount reported as derivatives are very small relative to the amount reported as extract (South Africa reported exporting 3130 t of extract compared to 105 t of derivatives, whilst importers world-wide reporting importing 1424 t of extract compared to 5 t of derivatives), and thus the amount reported under the term ‘derivative’ cannot account for the gap between reported imports and exports of *A. ferox* extract.

Because it is not possible to sum together such a variety of CITES terms and units it is not possible to calculate the total amount of reported trade in *A. ferox*. Therefore, the rest of the report will focus on trade reported under the CITES term ‘extract’, which represents by far the majority of trade.

Table 3

Total reported annual exports of *Aloe ferox* extract from South Africa to the rest of the world, according to importers (Imp) and according to South Africa (Exp) (1994-2003).

Year	Quantity (kg) (Imp)	Quantity (kg) (Exp)	Difference in reported trade (kg) (Importer minus Exporter report)
1994	130 489	301 187	170 698
1995	68 811	517 655	448 844
1996	79 497	279 818	200 321
1997	193 272	423 538	230 266
1998	185 923	-*	-
1999	112 001	324 939	212 938
2000	156 568	285 986	129 418
2001	177 228	349 494	172 266
2002	167 592	332 249	164 657
2003	152 632	315 510	162 878
Total	1 424 013	3 130 374	1 706 361

Source: Adapted from CITES trade data compiled by UNEP-WCMC, Cambridge, UK.

* In 1998, South Africa's CITES annual report was incomplete and hence the figure above does not reflect zero exports in 1998 but rather a lack of reporting on the trade.

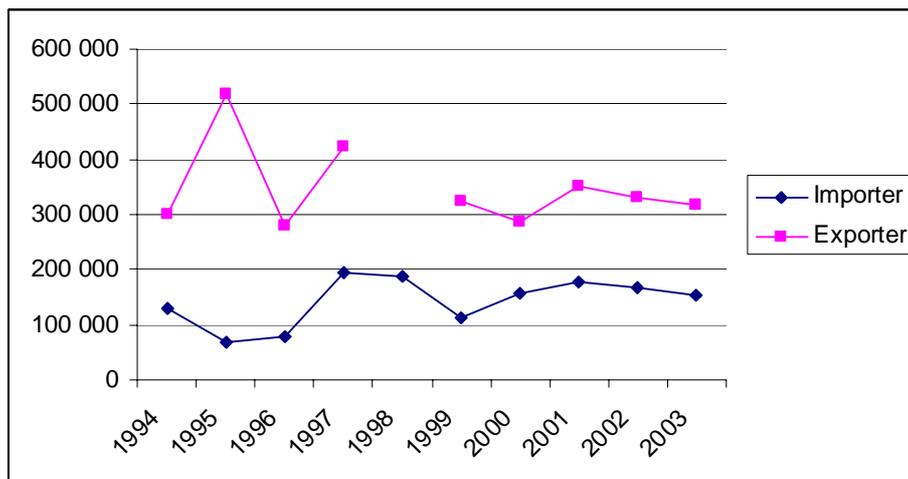
Between 1994 and 2003⁴, South Africa reported exporting an average of 348 t of *A. ferox* extract per year with a peak in 1995 at 518 t. Overall, reported South African exports of *A. ferox* extract have fluctuated from year-to-year but on average appear to have remained relatively stable over the study period (**Table 3, Figure 1**). The extent of fluctuation in reported exports of extract from South Africa appear to have decreased over time (1998-2003) (**Figure 1**). As was the case with many other terms, South Africa's reported exports of *A. ferox* extract were much larger than reported imports by

⁴ Excluding 1998 for which South Africa did not report exporting any *Aloe ferox* due to an incomplete CITES annual report.

importing countries. Because South Africa bases its CITES annual reports on permits issued rather than actual trade (D. Newton, TRAFFIC East/Southern Africa, *in litt.*, 21 April 2006), over-reporting may occur if permits are issued but not used. The level of trade reported by South Africa and that reported by importers followed a similar trend, although South Africa reported exporting around twice the quantity reported to have been imported, apart from 1995 when South Africa reported exporting 7.5 times more extract than was reported to have been imported (Table 3, Figure 1).

Figure 1

Total reported (direct) annual exports of *Aloe ferox* extract (kg) from South Africa to the rest of the world (1994-2003), according to importer and exporter records.



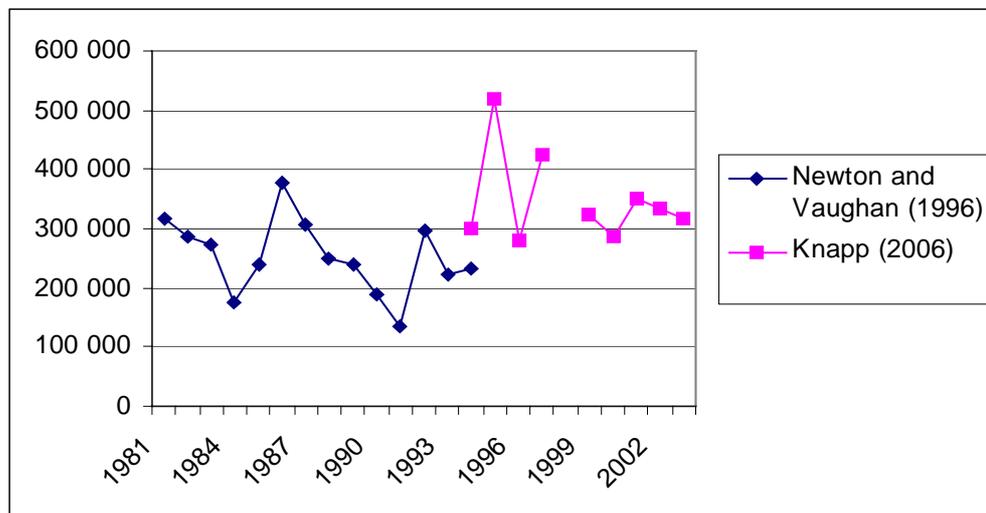
Source: Adapted from CITES trade data compiled by UNEP-WCMC, Cambridge, UK.

Figure 2 combines the data on South Africa's reported exports of *A. ferox* between 1994 and 2003 (Figure 1) with older data (1981 and 1994). The 1981-1994 data are taken from Newton and Vaughan (1996) and are based on South African CITES annual report data, cross-checked by Newton and Vaughan with the South African export permits, on which the annual reports were based; some data were amended as a result. The data show that reported exports from South Africa were higher between 1994-2003⁵ (an average of 348 t reported to be exported annually) than between 1981-1994 (252 t). In 1994, the only year for which the two data sets overlap, reported export of *A. ferox* extract from South Africa based on CITES annual reports (301 t) exceeded reported extract based on South African CITES export permits (233 t).

⁵ Excluding 1998 for which South Africa did not report exporting any *Aloe ferox* due to an incomplete CITES annual report.

Figure 2

Total reported annual exports of *Aloe ferox* extract (kg) (all sources) from South Africa to the rest of the world (1981-2003).



Source: Data for 1981-1994 come from Newton and Vaughan (1996) and are based on South African CITES annual reports, corrected using CITES export permits. Data for 1994-2003 are adapted from CITES trade data compiled by UNEP-WCMC, Cambridge, UK, which are based on South African CITES annual reports without corrections.

South Africa reported exporting *A. ferox* extract to 24 countries between 1994 and 2003 but of these, only seven have reported importing extract from South Africa (plus Switzerland which reported importing extract but to which South Africa did not report exporting extract). Based on South Africa's reported trade, the largest importers of *A. ferox* extract from South Africa were: Germany (with 840 t between 1994 and 2003), the UK (642 t), Italy (587 t) and Japan (309 t) (**Table 4**). According to importers reports, the largest importers were: Germany (673 t), Japan (347 t) and Italy (328 t).

Table 4

Total reported exports of *Aloe ferox* (all sources) from South Africa to all importers based on importer (Imp) and exporter (Exp) records (1994-2003)

Importer	Quantity (kg) (Imp)	Quantity (kg) (Exp)
Argentina		273 405
Austria		4 804
Belgium	6	2 411
Canada		121 801
China		18 000
Colombia		2 076
Denmark		2 384
France	27 800	60 113
Germany	673 257	839 756
India		2 000
Italy	328 035	586 615
Japan	346 785	309 022
Korea, Republic of		7 100
Mexico		5 500
Netherlands		5 071
Pakistan		27 800
Poland	41 750	38 750
Saudi Arabia		15 579
Sierra Leone		4 517
Spain	6 000	12 813
Sri Lanka		18 916
Switzerland	380	
Thailand		94 703
UK		641 527
USA		35 711
Total	1 424 013	3 130 374

Source: Adapted from CITES trade data compiled by UNEP-WCMC, Cambridge, UK.

European Union imports

For many of the main terms under which *A. ferox* was reported to be traded, South Africa's reported exports went almost exclusively to the EU Member States: dried plants, extract, leaves, derivatives (reported in kilogrammes or without units), stems and extract (reported as kilogrammes) (**Table 5**).

Table 5

Total reported exports of *Aloe ferox* from South Africa (main terms and units) world-wide and to the 25 EU Member States (EU25) (1994-2003) based on importer records

Term (unit)	EU25	World-wide	EU25 as % of world-wide imports
Derivatives	1 457	1562	93
Derivatives (kg)	4 083	5 083	80
Derivatives (litres)	0	47 520	0
Dried plants	44 813	44 813	100
Extract	35 776	35 791	100
Extract (kg)	1 076 848	1 424 013	76
Extract (litres)	33 164	86 195	38
Leaves	26 950	26 950	100
Live	360	36 818	1
Stems	27 740	31 772	87
Timber ¹	0	24 325	0
Timber ¹ (kg)	0	8 312	0

Source: Adapted from CITES trade data compiled by UNEP-WCMC, Cambridge, UK.

¹The term timber generally refers to sections of dried hollow stem that are often used in the dried flower trade

The EU Member States have never reported importing *A. ferox* as timber or as derivatives reported in litres (**Table 5**). However, South Africa has reported exporting to EU Member States 9 987 litres of derivatives, 76 558 timber pieces and 803.2 kg of timber pieces. It appears therefore that either EU Member States do not report in their CITES annual reports trade in *A. ferox* traded as timber or derivatives reported in litres, or that South Africa has issued permits for these shipments but that the shipments were never exported. In the case of timber pieces, which refer to sections of dried hollow *A. ferox* stem that are often used in the dried flower trade, it could be that EU importers use alternative terms to describe these shipments. The EU Member States also reported importing only 360 live plants from South Africa whilst the latter reported exporting 6118 live plants (plus 2500 kg of live plants) to EU Member States.

Of the 1077 t of extract reported to be imported from South Africa by the EU Member States, 89.4% was reported as wild-sourced (962 t), 10.6% (114 t) had no reported source and under 0.1% (1 t) was reported to be from artificially propagated plants (presumably from plantations).

Six EU Member States have reported importing *A. ferox* extract (kg): Belgium, France, Germany, Italy, Poland and Spain, whilst South Africa has reported exporting *A. ferox* extract (kg) to the previously listed Member States as well as to four others: Austria, Denmark, the Netherlands and the UK. The annual exports of *A. ferox* extract from South Africa to the largest EU importers (based on South Africa's reported trade) are detailed in **Table 6**.

Table 6

Total reported exports of *Aloe ferox* extract (t) from South Africa to the main importing EU Member States (1994-2003) based on importer (Imp) and exporter (Exp) data

Year	DE (Imp)	DE (Exp)	FR (Imp)	FR (Exp)	GB (Imp)	GB (Exp)	IT (Imp)	IT (Exp)	PL (Imp)	PL (Exp)
1994	78.5	133.1		0				50.4		
1995	35.3	127.2				274.0	6.4	15.4		
1996	67.5	145.5				43.4	12.0	12.0		
1997	116.2	132.6		1.6		64.2	18.0	78.6		
1998	92.4	.*		.*		.*	15.0	.*		.*
1999	17.4	40.5		9.2		41.4	47.6	90.6	5.0	5.0
2000	65.4	58.2		6.0		37.9	54.2	94.9		
2001	53.0	53.3	4.0	17.8		57.5	70.8	81.5	15.0	15.0
2002	67.8	66.7	14.8	25.5		59.5	51.0	73.1	11.0	11.0
2003	79.8	82.5	9.0			63.5	53.1	90.1	10.8	7.8
Total	673.3	839.8	27.8	60.1		641.5	328.0	586.6	41.8	38.8

Source: CITES trade data compiled by UNEP-WCMC, Cambridge, UK.

* In 1998, South Africa's CITES annual report was incomplete and hence the figure above does not reflect zero exports in 1998 but rather a lack of reporting on the trade.

Germany is reportedly the main destination for *A. ferox* extract (kg) from South Africa, with almost 840 t being documented by South Africa. According to Germany's reports, imports of *A. ferox* extract peaked in 1997 at 116 t but South Africa reported peak exports of over 145 t in 1996. This one-year difference in peak imports reported by Germany compared to exports reported by South Africa may be explained by 'year-end reporting' problems, whereby exports at the end of one year are not reported on by the importer until the following year. However, this would still not explain the difference in total amounts traded reported by South Africa and Germany. Despite the discrepancies in amounts reported to be traded by Germany and South Africa, figures from both sources seem to indicate increasing levels of trade from 1999 to 2003. It is also interesting to note that in the most recent years covered in this report (2001-2003), the discrepancy between reported exports by South Africa and reported imports by Germany was much smaller than in earlier years (**Table 6**).

Although South Africa reports the UK as being the second largest importer of *A. ferox* extract over the period 1994 to 2003, the UK has not reported importing *A. ferox* extract during this period. Reported exports to the UK peaked in 1995 at over 274 t then dropped and remained on average fairly level

between 1996 and 2003 (**Table 6**). Between 1994 and 2003, the UK has only reported one import of *A. ferox*, which consisted of three live, artificially propagated plants, imported in 2002.

Italy is the third largest reported importer of *A. ferox* extract, with South Africa reporting exports to Italy of over 580 t between 1994 and 2003. Exports to Italy have increased between 1995-2000 peaking at 95 t (according to South Africa's reports) in 2000 then staying relatively stable thereafter.

Poland started reporting imports of *A. ferox* extract in 1999 and reported imports ranged between 5-15 t a year (1999-2003). France started reporting imports of *A. ferox* in 2001 although South Africa reported exporting to France before this, and reported exporting a total of over 68 t of extract to this country during this period.

European Union exports and re-exports

The vast majority of EU re-exports of *A. ferox* consisted of extract but the EU Member States also re-exported some dried plants, derivatives and a few other terms in small quantities (**Table 7**).

Table 7

Total quantities (kg) of wild South African *Aloe ferox* reported as having been re-exported from EU Member States, according to re-exporting EU Member States (Re-exp) and to importers (Imp) (1994-2003)

Term	Quantity (kg) (Re-exp)	Quantity (kg) (Imp)
Derivatives (kg)	307	5 673
Dried plants (kg)	13 772	1 800
Extract (kg)	329 333	135 509
Powder (kg)		6 065
Specimen	1	0
Unspecified	3 020	0

Source: CITES trade data compiled by UNEP-WCMC, Cambridge, UK.

Given that global imports of *A. ferox* extract were dominated by the EU, it is not surprising that global re-exports of extract originally from South Africa came virtually exclusively from EU Member States (99% of global re-exports of extract excluding re-exports from South Africa). Of the 962 t of wild-sourced extract that the EU Member States have reported importing from South Africa (1994-2003), 34% (according to EU Member States' reports – see **Table 8**) was subsequently re-exported outside the EU⁶. However, given the apparent problems of reporting noted above, it may be that more than 34% of

⁶ As EU Member States do not report on their trade in Annex B specimens to other EU Member States, all of the reported re-exports from EU Member States refer to re-exports outside the EU, apart from re-exports that took place between new EU Member States prior to their accession, and 'old' EU Member States.

the extract imported into the EU was being re-exported but that the countries involved were not reporting all their re-exports (either as extract or after being processed into final products).

Table 8

Total quantities of wild South African *Aloe ferox* extract reported as re-exports and corresponding imports (1994-2003)

Re-exporting country	Quantity reported by re-exporting country (kg)	Quantity reported by importing countries (kg)
Germany	253 917	89 646
Poland	30 875	33 373
Italy	35 407	10 610
France	6634	1 880
Switzerland	2 914	831
Spain	2 500	0
Japan	120	200
Korea, Republic of	0	2 100
Israel	0	200
EU Subtotal	329 333	135 509
Grand Total	332 367	138 840

Source: CITES trade data compiled by UNEP-WCMC, Cambridge, UK.

The countries outside the EU, to which the EU Member States reported re-exporting the largest quantities of wild-sourced *A. ferox* extract between 1994 and 2003 were: the USA (76.4 t), the Republic of Korea (43.5 t), Argentina (24.2 t) and Brazil (15.7 t).

No country outside of South Africa reported exporting or re-exporting *A. ferox* extract derived from plantation grown (artificially-propagated) plants. All exports of artificially propagated *A. ferox* from EU Member States consisted of live plants, suggesting that *A. ferox* is cultivated in the EU to be traded for its ornamental rather than medicinal properties. Belgium exported 820 live plants, France 50 and the UK and Denmark one each.

DISCUSSION AND CONCLUSIONS

Global trade

As was the case in the past (Newton and Vaughan, 1996), extract was the most important form in which *A. ferox* was reported to be exported from South Africa, with South Africa reporting exports of over 3130 t of extract world-wide between 1994 and 2003. The total amount of *A. ferox* exported from South Africa may be much larger than 3130 t, as this does not include exports reported under different terms, such as derivatives, which were exported to a lesser degree than extract but nevertheless in substantial quantities. In addition, this total does not include possible undocumented or illegal trade. A previous study of the *A. ferox* industry suggested that illegal or undocumented trade in this species was almost as large as the legal trade (Newton and Vaughan, 1996). Given the lack of proactive management of the industry, it is possible that such undocumented or illegal trade continues up to present and may represent substantial volumes of *A. ferox* extract.

For virtually all CITES trade terms such as extract, derivatives or leaves, South Africa's reported exports were larger than imports reported by recipient countries. Oldfield (1992), reported that many exporting countries did not report trade in aloe parts and derivatives in their CITES annual reports. This report supports that finding, as 17 countries have been identified as not reporting imports of extract from South Africa despite South Africa reporting exports to these countries.

Discrepancies between importer and exporter records for CITES trade data are not uncommon. In the case of *A. ferox* exports from South Africa, over-reporting by South Africa may have occurred, given that, as is the case for many other countries, South Africa bases its annual reports on permits issued rather than permits used and/or actual trade which occurred and not all issued permits may have been used. In terms of the two largest reported EU importers (based on reported exports from South Africa), Germany bases its annual reports on actual trade whilst the UK bases its CITES annual reports on permits issued.

However, both the extent to which exporter records exceeded importer records and the number of countries which are not reporting any imports from South Africa imply that either South Africa is substantially over-reporting its exports or importers are systematically under-reporting or not reporting at all (or both).

Discrepancies between import and export data may also arise due to so-called 'year-end reporting', when exporters may report exporting specimens in one year but the importer may only report the import the following year. However, end-year reporting problems cannot account for the large discrepancies both in total amount of *A. ferox* extract reported to be traded, and the discrepancies occurring virtually every year (as illustrated for example in **Table 4** for global trade in extract and in **Table 6** for trade in extract by EU Member States).

Over the last few years (1997-2003), total reported exports of *A. ferox* from South Africa have fluctuated but remained fairly constant over time. However, a longer-term view reveals that South Africa's reported exports were higher between 1994-2003 (based on CITES annual reports) than between 1981-1994 (based on CITES annual reports corrected using export permits). Although, in theory, South Africa's CITES annual reports are based on issued CITES export permits, differences may occur, for example through data entry errors, as shown by the difference in South African exports of extract for 1994 (301 t based directly on annual reports compared to 233 t based on annual reports corrected by cross-checking with export permits).

Whereas an analysis of for example the past five years of trade data may have suggested a small decline in the reported exports of this species from South Africa, a twenty-year data set appears to show an overall increase in exports. Analysing long-term trends in trade for fluctuating industries such as the *A. ferox* industry, demonstrates the value of long-term monitoring of trade in a particular species, which stems from this species being listed on CITES.

European Union trade

The vast majority of EU imports of *A. ferox* extract from South Africa involved wild specimens, with only 0.1% of EU imports being reported as coming from plantation-grown plants. *A. ferox* is also artificially propagated in Europe but for live ornamental plants, not for extract.

Over three quarters of South Africa's exports of *A. ferox* extract was imported by EU Member States, as well as the entirety of South Africa's exports of dried plants and leaves, and the majority of derivatives and stems. The EU Member States reported re-exporting (outside the EU) 34% of the *A. ferox* extract which they imported between 1994 and 2003, suggesting that the majority of *A. ferox* extract remained within the EU. It could be that some of the *A. ferox* imported into the EU as extract was re-processed and then re-exported from the EU in a different form (and hence not reported to be re-exported as extract but under another CITES term, or not reported at all). However, given that the EU Member States only reported re-exporting 5673 kg of *A. ferox* "derivatives", the most commonly used term for processed medicinal products, this would suggest that *A. ferox* is not being re-exported from the EU as derivatives, unless it is being re-exported as derivatives but without being reported at all.

Based on South Africa's reported trade, the main EU importers of *A. ferox* extract were: Germany (839 t of extract (1994-2003)), the UK (641 t) and Italy (587 t). Four EU Member States (Austria, Denmark, the Netherlands and the United Kingdom) did not report imports despite reported exports from South Africa and a further five Member States (Belgium, France, Germany, Italy and Spain) reported lower imports than South Africa's reported exports to them. The case of the UK is striking, as the UK has not reported any imports of *A. ferox* extract (1994-2003) although South Africa during this period reported exporting almost 700 t of extract to the UK and during 2006 issued at least one export permit to a UK-based company (D. Newton, TRAFFIC East/Southern Africa, pers. comm. 11 May

2006). However, the UK has no record of receiving applications for CITES permits to import *A. ferox* extract (UK CITES Management Authority, pers. comm. 6 April 2006).

If it is indeed the case that many EU Member States, as well as other CITES Parties outside the EU are not reporting their trade in extract for *A. ferox* extract, then there is a risk that this lack of reporting also applies to the trade of extract from other CITES-listed plant species.

Given the reporting problems for *A. ferox*, the potential illegal and unreported trade which in the past was estimated to be substantial, the increase in exports in the past decade compared to the 1980s and mid 1990s, and in the absence of new field research, it is not possible to assess whether the current levels of exports from South Africa are sustainable. Based on concerns about the sustainability of the trade, in May 2005, the CITES Plants Committee decided to include *A. ferox* in the CITES Significant Trade Review Process (Anon., 2005). South Africa will undertake a preliminary study which will focus on status and management of this species in South Africa and which should be completed in late 2006 or early 2007 (Dr. J. Donaldson, South African National Biodiversity Institute, pers. comm. 13 February 2006).

RECOMMENDATIONS

Based on the findings from this report, the following recommendations are made:

- The European Commission should remind EU Member States about the obligation to report imports of *A. ferox*, and other Appendix II plants, in whatever form the plants, their parts or derivatives are imported (unless exemptions apply);
- Where discrepancies occur between EU Member States' and South Africa's reported trade in *A. ferox*, Member States should provide information, where possible, to the European Commission if any applications for import permits have been received and clarify why there is no reporting on actual imports or why they are reporting lower imports than South Africa reports exporting them;
- EU Member States should liaise with South Africa to obtain details of EU importers of *A. ferox* and clarify why these importers are not applying for import permits
- Exporters (including re-exporters) and importers should standardize the terms and units of measurement used when reporting trade in *Aloe ferox*, e.g. using grammes and kilogrammes rather than litres and millilitres, to enable more accurate estimates of trade volumes.

REFERENCES

- Anon. (1985) *African pharmacopoeia, Vol. 1*, 1st ed. Organization of African Unity, Scientific, Technical and Research Commission, Lagos, Nigeria.
- Anon. (1998) *Species Update: No. 1, Aloe ferox*. TRAFFIC East/Southern Africa. 4pp.
- Anon. (2005) Summary record – Fifteenth Meeting of the Plants Committee. 17-21 May 2005, Geneva, Switzerland. 75 pp.
- Anon. (2006a) Review of Significant Trade in specimens of Appendix-II species. Species selected following CoP13. Plants Committee 16 Doc. 10.3. Downloaded from <http://www.cites.org/eng/com/PC/16/E-PC16-10-03.pdf> on 26 May 2006.
- Anon. (2006b) *2006 IUCN Red List of Threatened Species*. <www.iucnredlist.org>. Downloaded on 9 May 2006.
- Donaldson, J. (1989) *Aloe ferox*. Pp. 88-94 in M.C. Muñoz (Comp.) (1989) *Proposed revision of Resolution Conf. 9.24 (CoP12 Com. I. 3). Criteria for listing on Appendix I and Appendix II. Tests of the applicability of the criteria*. 201pp.
- Lange, D. (1999) *Identification Training for Medicinal and Aromatic Plants covered by CITES and EU Regulation 2307/97*. Lecture Script Version 2 – En, 25.05.99. BfN – Skripten 11. Bundesamt fuer Naturschutz (BfN) / German Federal Agency for Nature Conservation, Bonn, Germany. 98pp.
- McGough, N. Groves, M., Mustard, M., Brodie, C. and Sajeve, M. (2004) *CITES and Succulents*. Royal Botanic Gardens, Kew, UK. 200pp.
- Newton, D.J. (1993) Is the export industry endangering the bitter aloe? *Our Living World* p. 10.
- Newton, D., J. and Vaughan, H. (1996) *South Africa's Aloe ferox Plant, Parts and Derivatives Industry*. TRAFFIC East/Southern Africa. 61pp.
- Oldfield, S. (1992) *Significant Trade in CITES Appendix II Plants – Aloes*. Fourth CITES Plants Committee Meeting, Brussels, Belgium, 1993. 20 pp.
- Oldfield, S. (1993) International Trade in Aloes. *TRAFFIC Bulletin* 14(1): 25-32.