

CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA



Fourteenth meeting of the Plants Committee
Windhoek (Namibia), 16-20 February 2004

Significant trade in plants

SELECTION OF NEW SPECIES

1. The Annex to this document has been prepared by UNEP-WCMC.
2. In accordance with paragraphs b) and c) of the section *Selection of species to be reviewed* in Resolution Conf. 12.8 on Review of Significant Trade in specimens of Appendix-II species, the Plants Committee should select for its review species of priority concern. The selection should be based on recorded trade levels and information available to the Plants Committee, the Secretariat, Parties or other relevant experts.
3. The Secretariat has required UNEP-WCMC to provide a summary of trade data in Appendix-II plant species over the five most recent years, and guidance on the selection of species for review.
4. The Plants Committee is requested to consider the document *Review of Significant Trade – Analysis of Trade Trends with notes on the conservation status of selected species – Volume 1. Plants*, by UNEP-WCMC (see the Annex to this document, English only) and to recommend a shortlist of species for its Review of Significant Trade.

REVIEW OF SIGNIFICANT TRADE

ANALYSIS OF TRADE TRENDS

WITH NOTES ON THE CONSERVATION STATUS OF SELECTED SPECIES

Volume 1. Plants

Prepared for the

CITES Plants Committee, CITES Secretariat



by the

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INTRODUCTION

Resolution Conf. 12.8 Review of Significant Trade in specimens of Appendix II species directs the Animals and Plants Committees, in cooperation with the Secretariat and experts, and in consultation with range States, to review the biological, trade and other relevant information on Appendix II species subject to significant levels of trade, to identify problems and solutions concerning the implementation of Article IV, paragraphs 2 (a), 3 and 6 (a) of the Convention. As part of this procedure the Secretariat requested UNEP-WCMC to produce a summary from the CITES Trade database of annual report statistics showing the recorded net level of exports for Appendix II species over the five most recent years.

This report includes a summary from the CITES Trade database of annual report statistics for Appendix-II plant species over the eleven most recent years (1992-2002) for specimens recorded from wild sources¹. Following a detailed examination of the data, UNEP-WCMC determined that the majority of re-export data for wild collected specimens did not add new information to the analysis of the species for review. Therefore, this report includes a summary from the CITES Trade database of annual report statistics showing the recorded gross level of exports², but excludes data on re-exports for the majority of plant species³.

UNEP-WCMC has included additional species information sections in this report to supplement the usual tables of CITES trade statistics. The aim of including these new sections is to assist the CITES Plants Committee with the difficult task of species selection on the basis of significant trade. The report is structured as follows:

Section 1 highlights species as possible candidates for review by the Plants Committee (whether or not such species have been the subject of a previous review, although excluding those currently under review).

Section 2 highlights a possible country candidate for the country-level review of significant trade.

Section 3 (see separate Excel spreadsheet) includes tables of recorded level of exports for Appendix-II plant species over the eleven most recent years (1992-2002).

¹ Included with wild collected specimens are those specimens recorded without a source but appeared likely, on examination, to be from wild sources based on knowledge of the species, its range states and likely exporters of wild specimens.

² Gross exports = the total quantity (re-)exported of a given commodity.

³ With the exception of *Galanthus* spp. re-exports from Georgia – see explanation in methodology.

METHODOLOGY

In addition to the summary from the CITES Trade database of annual report statistics, UNEP-WCMC has processed the trade data with the aim of assisting the CITES Plants Committee with the task of species selection for the Review of Significant Trade. Species were selected as possible candidates for review of significant trade according to the following steps:

- 1) A flowchart (see Figure 1) of yes/no answered questions was used to test information on gross level of exports, based on a number of statistical factors and conservation status. All those with final answers “consider for inclusion in current selection process” were included in a first round review;
- 2) Recorded trade levels of all species were individually examined, and those not selected by the flowchart but for which it was thought that trade was significant were also included in a first round review; and
- 3) Additional trade and conservation status information were considered for all species selected under steps 1) and 2), above, and a final list highlighted possible candidates for review.

Trade statistics were extracted from the UNEP-WCMC CITES trade database⁴ for Appendix II plant species where the reported source was wild-collected or where there was no reported source but on examination where the material was thought to be wild-collected based on acknowledge of the species and the country of export/origin. The number of individual trade records involved totalled over 70,000. Upon examination of these data, terms were combined for some species where this was thought appropriate. Parties often report timber in both kilograms and cubic metres. Therefore, prior to the creation of the gross export tables, export data reported in kilograms were converted to cubic metres where a conversion factor for the species was available using CITES Identification Manual conversion factors, see Table 1.

Table 1: Timber conversion factors

Species	Mean specific weight.
<i>Pericopsis elata</i>	0.66 g/cm ³
<i>Guaiacum sanctum</i>	1.23 g/cm ³
<i>Guaiacum officinale</i>	1.23 g/cm ³
<i>Swietenia humilis</i>	0.61 g/cm ³
<i>Swietenia mahogani</i>	0.75 g/cm ³
<i>Prunus africana</i>	0.74 g/cm ³

Data taken from Clemente, M. 1999. *Timber Identification. CITES Identification Manual Vol. 1 Flora*. CITES Secretariat, Geneva.

The majority of re-export data were excluded from the data tables because on examination these data did not add any new information to the analysis of species but only showed data already reported as exports. However, re-export data of *Galanthus* species with origin Georgia were included, as there were shipments not originally reported as exports by Georgia that had then been re-exported with the reported origin Georgia.

The selection of species highlighted as possible candidates for review by the Plants Committee was initially derived using statistical analysis and a flowchart with ‘yes’ and ‘no’ questions to answer (see Figure 1). This first step statistical review of data and flowchart was based on the following criteria: a measure of the slope and of spread of trade data over ten years (1992-2001) was produced; then, if the species is listed in the 2003 IUCN Red List of Threatened Species⁵, the global threat status was taken into consideration. Data for 2002 have been included in the full data tables (see Section 3 – Excel spreadsheet), but were excluded in the statistical analysis because, as of 10 December 2003, only 50% of Annual Reports to CITES for 2002 had been received by UNEP-WCMC and included in the CITES Trade database.

Statistics: Slope

A species that shows an increase in levels of trade over time can generally be assumed to be in greater need of attention than a species for which trade has been decreasing. However, there may be cases where a decline in trade could be the result of a decline of the species in the wild. Therefore we assessed those species for which there was a high positive slope

⁴ Maintained by UNEP-WCMC on behalf of the CITES Secretariat.

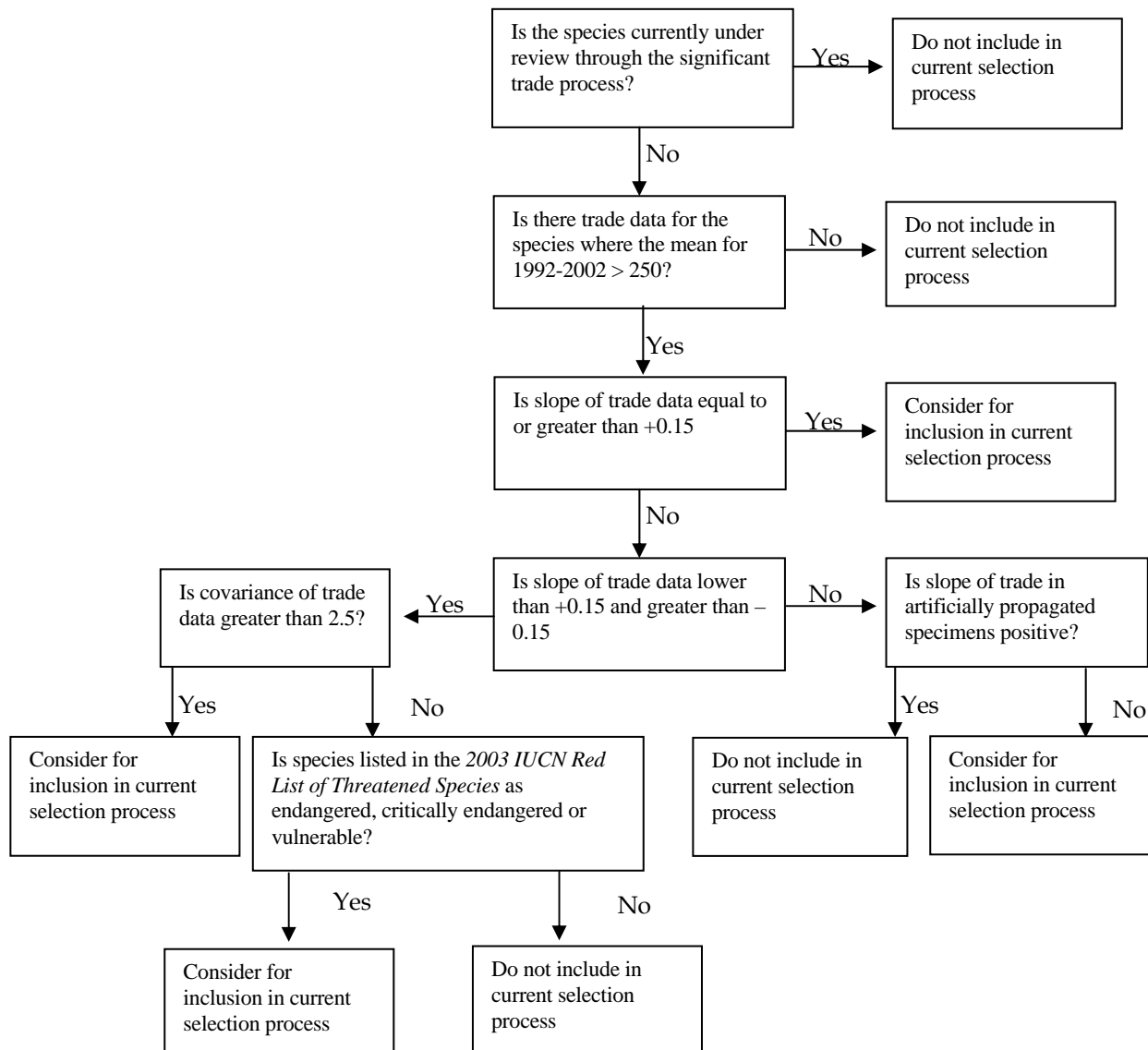
⁵ IUCN 2003. 2003 IUCN Red List of Threatened Species. www.redlist.org

and low negative slope. We used Excel's 'slope' function, which returns the slope of the linear regression line through data points in known_ys and known_xs. The slope is the vertical distance divided by the horizontal distance between any two points on the line, which is the rate of change along the regression line. In this case the xs are ten consecutive years (1992-2001) and the ys represent the level of trade, measured as the number of specimens traded globally (net) every year. Because the value for the slope depends partly on the absolute level of trade, we divided the slope by the mean (total level of trade over the ten year period divided by ten or less depending on the year listed on the CITES Appendices) to allow a proper comparison between species traded at different levels. In the rest of the text, any mention of 'slope' refers to the measure of slope divided by mean.

Statistics: Spread

It was decided that a species showing considerable variation in past levels of trade needs more attention than one showing constant trade levels. Many measures of spread exist but the most appropriate when comparing across groups with different means is the coefficient of variation (CV). The CV is used to compare the amount of variation in populations with different means where direct comparisons of the standard deviations (a more common measure of spread) are difficult to make, as they are confounded by differences in scale. The CV is calculated as the standard deviation divided by the mean.

Figure 1: Flow chart for selection of candidate species for consideration in the Significant Trade Review Process



SECTION 1: SPECIES IDENTIFIED AS POSSIBLE CANDIDATES FOR REVIEW OF SIGNIFICANT TRADE

Following the first step statistical analysis and flow chart method of species selection on the basis of trade and threat status, an initial list of 48 species was selected as possible candidates for review of significant trade. CITES trade data for each of these species were reviewed, together with known conservation status and management of the species. Table 2 lists the 48 species and the decision for their inclusion or exclusion as possible candidates for review.

Table 2: Species identified for inclusion following flow chart process

SPECIES	INCLUDED /EXCLUDED	COMMENT
<i>Galanthus woronowii</i>	INCLUDED	See species sheet below
<i>Podophyllum hexandrum</i>	INCLUDED	See species sheet below
<i>Carnegiea gigantea</i>	INCLUDED	See species sheet below
<i>Echinopsis chiloensis</i>	EXCLUDED	The majority of the trade is in rainsticks that are mostly harvested from already dead material
<i>Echinopsis cuzcoensis</i>	EXCLUDED	The majority of the trade is in rainsticks that are mostly harvested from already dead material
<i>Echinopsis pachanoi</i>	EXCLUDED	The majority of the trade is in rainsticks that are mostly harvested from already dead material
<i>Echinopsis peruviana</i>	EXCLUDED	The majority of the trade is in rainsticks that are mostly harvested from already dead material
<i>Eulychnia acida</i>	EXCLUDED	The majority of the trade is in rainsticks that are mostly harvested from already dead material
<i>Opuntia bigelovii</i>	EXCLUDED	The majority of the trade is in already dead material
<i>Opuntia fulgida</i>	EXCLUDED	The majority of the trade is in already dead material
<i>Opuntia imbricata</i>	EXCLUDED	The majority of the trade is in already dead material
<i>Opuntia subulata</i>	EXCLUDED	The majority of the trade is in already dead material
<i>Stenocereus thurberi</i>	EXCLUDED	The majority of the trade is in already dead material
<i>Cyathea contaminans</i>	INCLUDED	See species sheet below
<i>Cyathea cunninghamii</i>	INCLUDED	See species sheet below
<i>Cyathea dealbata</i>	INCLUDED	See species sheet below
<i>Cyathea medullaris</i>	INCLUDED	See species sheet below
<i>Cyathea smithii</i>	INCLUDED	See species sheet below
<i>Cibotium barometz</i>	INCLUDED	See species sheet below
<i>Dicksonia sellowiana</i>	EXCLUDED	
<i>Euphorbia antisiphilitica</i>	EXCLUDED	
<i>Euphorbia gottlebei</i>	EXCLUDED	
<i>Euphorbia hedyotoides</i>	EXCLUDED	
<i>Pterocarpus santalinus</i>	INCLUDED	See species sheet below
<i>Aloe ferox</i>	EXCLUDED	It was decided that South Africa has adequate species monitoring and management
<i>Nepenthes mirabilis</i>	EXCLUDED	
<i>Ascocentrum christensonianum</i>	INCLUDED for Viet Nam	See Section 2
<i>Bletilla striata</i>	INCLUDED	See species sheet below
<i>Christensonia vietnamica</i>	INCLUDED for Viet Nam	See Section 2
<i>Cymbidium ensifolium</i>	EXCLUDED	
<i>Cymbidium goeringii</i>	EXCLUDED	
<i>Cypripedium parviflorum</i>	EXCLUDED	
<i>Dendrobium aduncum</i>	INCLUDED for Viet Nam	See Section 2
<i>Dendrobium amabile</i>	INCLUDED for Viet Nam	See Section 2
<i>Dendrobium herbaceum</i>	INCLUDED for Viet Nam	See Section 2
<i>Dendrobium moniliforme</i>	INCLUDED for Viet Nam	See Section 2
<i>Dendrobium nobile</i>	INCLUDED for Viet Nam	See Section 2
<i>Gastrodia elata</i>	EXCLUDED	

SPECIES	INCLUDED /EXCLUDED	COMMENT
<i>Habenaria acuífera</i>	EXCLUDED	
<i>Ludisia discolor</i>	EXCLUDED	
<i>Vanilla aphylla</i>	EXCLUDED	
<i>Cyclamen coum</i>	INCLUDED	See species sheet below
<i>Hydrastis canadensis</i>	EXCLUDED	
<i>Bowenia serrulata</i>	EXCLUDED	
<i>Taxus wallichiana</i>	EXCLUDED	
<i>Nardostachys grandiflora</i>	INCLUDED	See species sheet below
<i>Guaiacum officinale</i>	EXCLUDED	Majority of trade is from Mexico where a species management programme is being implemented.
<i>Guaiacum sanctum</i>	EXCLUDED	Majority of trade is from Mexico where a species management programme is being implemented.

Although not highlighted after use of the flowchart decision-making process, six additional species listed in Table 3 were also selected for consideration after review of trade data or because they had been recently listed in Appendix II. They were then included or excluded on the basis of trade data and/or conservation and species management information.

Table 3: Additional species identified for consideration

SPECIES	INCLUDED /EXCLUDED	COMMENT
<i>Galanthus elwesii</i>	EXCLUDED	Data were reviewed for this species but Turkey, the only range State exporter, appears to have good management controls in place for this species
<i>Panax quinquefolius</i>	EXCLUDED	Data were reviewed for this species but the United States and Canada, major exporters in recent years, appear to have good management controls in place for this species
<i>Cistanche deserticola</i>	INCLUDED	See species sheet below
<i>Cyclamen cilicium</i>	EXCLUDED	Data were reviewed for this species but Turkey, the only range State exporter, appears to have good management controls in place for this species
<i>Cyclamen hederifolium</i>	INCLUDED	See species sheet below
<i>Picrorhiza kurroa</i>	EXCLUDED	The only reported exporter, China, is not a range State for this species, and it is likely that the reported trade refers to the closely related <i>P. scrophulariiflora</i> , which is not covered by the CITES listing (Mulliken, 2000)

The following pages provide accounts for the 16 species selected for possible review of significant trade.

1. *Galanthus woronowii*

FAMILY	AMARYLLIDACEAE
NAME AND AUTHOR	<i>Galanthus woronowii</i> Losinsk. in Kom.
SYNONYMS	<i>Galanthus ikariae</i> auct. non Baker, pro parte <i>Galanthus ikariae</i> ssp. <i>latifolius</i> Stern pro parte <i>Galanthus latifolius</i> auct. non Rupr.

DISTRIBUTION AND LOCAL CONSERVATION STATUS

Georgia: Occurrence reported (Davis et al., 1999). It occurs in forests, shrubwoods and lower mountain belt in Georgia (Anon., 2003). It is Vulnerable in Georgia (Anon., 2003). Discussions were held during the 11th Meeting of the Plants Committee on plant production techniques, particularly those in Georgia. The minutes of the meeting state "The authorities of Georgia and the Secretariat to look for a solution regarding source code to be included in export permits for *Galanthus woronowii*. It agreed that the bulbs currently harvested from agricultural fields are to be regarded as being of wild origin" (CITES Secretariat, 2002).

Netherlands: Reported as "rare, an occasional escape" (Davis et al., 1999).

Russian Federation: Occurrence reported in Black Sea Coast Area (Davis et al., 1999) and listed as Rare (Golvanov et al., 1988).

Turkey: Occurrence reported in the north-east (Davis, 1984; Davis et al., 1999).

United Kingdom: Reported as "rare, an occasional escape" (Davis et al., 1999).

It is of economic importance as an ornamental plant (GRIN, 2003).

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INTERNATIONAL TRADE

Data reported as *Galanthus ikariae* have been included with *Galanthus woronowii* as the former is now a recognised synonym of *Galanthus woronowii*.

Net Exports of live/bulbs of *Galanthus woronowii*

Exporter	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Georgia	0	0	0	0	0	10000000	10000000	0	5000042	150	12000285
Russian Fed.	0	0	515000	40000	10000000	0	0	0	0	0	0
Turkey	2277775	1894500	1990000	292400	615600	999908	2000000	11749915	15000000	3005950	2000000

QUOTAS

Export quotas of *Galanthus woronowii* as issued by Georgia and Turkey

Exporter	1999	2000	2001	2002	2003
Georgia	10000000	10000000	15000000	15000000	18000000
Turkey	2000000	2000000	2000000	2000000	2000000

2. *Podophyllum hexandrum*

FAMILY	BERBERIDACEAE
NAME AND AUTHOR	<i>Podophyllum hexandrum</i> Royle
COMMON NAME(S)	Himalayan may-apple
SYNONYMS	<i>Podophyllum emodi</i> Honigberger <i>Podophyllum emodi</i> var. <i>axillare</i> Chatterjee & Mukherjee <i>Podophyllum emodi</i> var. <i>bhootanense</i> Chatterjee & Mukherjee <i>Sinopodophyllum emodi</i> (Honigberger) Ying <i>Sinopodophyllum hexandrum</i>

DISTRIBUTION AND LOCAL CONSERVATION STATUS

Occurs in forests and on open slopes from 2400-4500 m (Polunin and Stainton, 1984). This species has been considered a rare and threatened species, and removal rates exceed natural regeneration rates (Nadeem *et al.*, 2000).

Afghanistan: Occurrence reported (Polunin and Stainton, 1984).

Bhutan: Reported as a totally protected species, of Indeterminate status (Ministry of Agriculture, Royal Government of Bhutan (1993). Recorded from Ha, Thimphu and Bumthang districts in Central Bhutan, and in Upper Mo Chu district in Northern Bhutan (Grierson and Long, 1984).

China: Occurrence reported (Polunin and Stainton, 1984).

India: Occurrence reported in Uttaranchal (Rao, 1998), and more particularly in Kumaon (Airi *et al.*, 2000), and Garhwal (Bhadula *et al.*, 2000). Reported in Himachal Pradesh, where it is found sporadically in Rohru, Kullu, Kangra, Chamba, Nichar and Lahaul & Spiti forest divisions (Chauhan, 1999). It is distributed in restricted pockets of the Himalayas ranging from 2,000 to 4,000 m (Bhadula *et al.*, 2000). The population of these plants throughout its range was observed to be very sparse, in decline, and receding towards higher elevations (Rao, 1998). It is variously considered as endangered (Bhadula *et al.*, 2000) or critically endangered (CAMP, 1998). It has declined considerably as a result of exploitation to meet the increasing demand of the pharmaceutical industry (Bhadula *et al.*, 2000). Export of this species from India has been prohibited, although illegal removal continues (Nadeem *et al.*, 2000).

Nepal: Recorded from the upper Langtang valley at 4120 m (Malla *et al.*, 1976).

Pakistan: Occurrence reported in north Pakistan (Ebel, 1998). It is vulnerable due to over-exploitation in Pakistan (Matin *et al.*, 2001).

"Several plants are of high conservation value, e.g. ...*Podophyllum hexandrum* ...for their valuable alkaloids and variable medicinal properties" (Anon., 1997). "Quite an important medicinal plant, the rhizome containing podophyllin. Recently investigated as a possible drug used in treatment of cancer" (Polunin and Stainton, 1984).

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INTERNATIONAL TRADE

Gross Exports of *Podophyllum hexandrum* from China

Term	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Derivatives (kg)	0	0	0	0	0	0	10000	0	0	0	0
Roots (kg)	0	0	0	0	0	0	0	570	16000	0	0
Seeds	0	0	0	0	0	0	0	30	0	0	0

3. *Carnegiea gigantean*

FAMILY CACTACEAE

NAME AND AUTHOR *Carnegiea gigantea* (Engelmann) Britton & Rose

COMMON NAME(S) Saguaro

SYNONYM *Cereus giganteus* Engelmann

DISTRIBUTION AND LOCAL CONSERVATION STATUS

At a global level, the species is considered to be demonstrably widespread, abundant and secure (Global Heritage Status Rank G5 (Secure) (21Mar1996)) (NatureServe, 2003).

Mexico: Occurrence reported (Hunt, 1999; Oldfield, 1997). "The saguaro is a common plant in the Sonoran Desert, not an endangered species" (National Parks Service, 2003).

USA: Occurrence reported (Hunt, 1999; Oldfield, 1997; USDA & NRCS, 2002). In the USA, it is found in Arizona and California; it is critically imperilled in California (NatureServe, 2003). "Despite laws regulating their collection, specimens of *C. gigantea* continue to be illegally removed from habitat to be sold in the commercial landscaping trade....Throughout the south-western USA Native Americans and gigantea collect the fruits of*C. gigantea*...for food" (Oldfield, 1997).

Harvested for ornamental value since the early twentieth century (Steenburgh and Lowe, 1977). The biggest threat to the saguaro is rapidly expanding human population and loss of saguaro habitat in the Tucson area. The saguaro is also threatened by invasive species, fire, frost and drought (National Parks Service, 2003).

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INTERNATIONAL TRADE

Gross Exports of *Carnegiea gigantean*

Exporter	Term	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
USA	live	140	45	136	69	44	0	41	0	10	0	0
Mexico	timber	0	0	64000	101651	0	115405	60080	52300	30000	120000	135500
Mexico	timber m3	0	33	0	190.136	48	40.48	2	73.6	73.6	0	98.14
Mexico	timber kg	0	0	0	0	0	0	3500	0	0	0	19560
USA	timber	9	12	0	0	0	50	14	0	0	0	0
Mexico	timber pieces	0	0	64000	101651	0	170040	30000	0	0	0	0
Mexico	timber pieces kg	0	0	0	0	0	0	16500	0	0	0	0
USA	timber pieces	0	0	0	0	0	0	0	13	10	0	0

4. *Cyathea contaminans*

FAMILY CYATHEACEAE

NAME AND AUTHOR *Cyathea contaminans* (Wallich ex Hook.) Copel. 1909

SYNONYMS *Alsophila acuta* C. Presl, 1848; *Alsophila brunoniana* Bed., 1866; *Alsophila clementis* Copel., 1906; *Alsophila contaminans* Wallich ex Hook. 1844, *Alsophila dealbata* C. Presl, 1848; *Alsophila glauca* (Blume) J. Sm. 1841; *Alsophila glaucescens* Wall., 1829; *Alsophila mertensii* Trevis., 1851; *Alsophila smithiana* C. Presl, 1848; *Alsophila smithii* Trevis., 1851; *Alsophila wallichiana* C. Presl, 1836; *Chnoophora glauca* Blume, 1828; *Sphaeropteris glauca* (Blume) R. Tryon, 1970

DISTRIBUTION AND LOCAL CONSERVATION STATUS

This is a very widespread tree fern that commonly grows as a coloniser in the tropics. Plants are fast growing and always occur in a sunny situation. It was previously known as *C. glauca* (Jones, 1987).

India: Occurrence reported (UNEP-WCMC Species database).

Indonesia: Occurrence in East Kalimantan reported (Suzuki, 2000) and west Java (Colijn, 2000). Due to the high demand for this species, it is becoming endangered (Anon., 2003b).

Malaysia: It is found in rather open places at moderate or high altitudes and often abundant on the edge of forest beside roads in Sarawak (Anon., 2003a) and occurrence reported in Mount Kinabalu, Sabah (Parris *et al.*, 1992). Reported as Lower Risk near threatened in Peninsular Malaysia.

Myanmar: Occurrence reported (UNEP-WCMC Species Database).

Papua New Guinea: This edible species occurs in areas ranging from 600 - 2,800. It is an important green leafy vegetable at pig feasts in the highlands of PNG (Kambuou, 1995). Reported as Lower Risk near threatened.

Philippines: Occurrence reported (Amoroso, 1990) and as Lower Risk near threatened.

Thailand: Reported as Lower Risk near threatened.

Viet Nam: Recorded in Xuan Lien proposed Nature Reserve (Le Trong Trai *et al.*, 1999). Reported as Lower Risk near threatened (Loc, 1992).

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INTERNATIONAL TRADE

Gross Exports of *Cyathea contaminans*

Exporter	Term	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Indonesia	dried plants	0	0	0	0	38897	0	89264	0	0	0	0
Malaysia	live	0	0	3	0	0	0	0	0	0	0	0
Indonesia	timber	0	0	0	0	61300	332404	313986	405788	52250.5	0	0
Indonesia	timber kg	0	0	0	0	0	0	0	0	0	997529	0
Indonesia	timber shipments	0	0	0	0	0	0	170220	147638	0	0	0

5. *Cyathea cunninghamii*

FAMILY	CYATHEACEAE
NAME AND AUTHOR	<i>Cyathea cunninghamii</i> Hook.f.
COMMON NAME(S)	Gully Tree Fern, Slender Tree Fern
SYNONYMS	<i>Alsophila cunninghamii</i> (Hook.f. in Hook., 1854) R. Tryon, 1970; <i>Cyathea boylei</i> F. Muell., 1881;

DISTRIBUTION AND LOCAL CONSERVATION STATUS

This species requires humus rich acid soil, shade and moisture and it detests sun and especially wind. Plants are slow growing (Jones, 1987) and reach 20 m in height (Salmon, 1980). It occurs mainly in sheltered gullies, overtopping *Dicksonia antarctica* (Bostock, 1998). *Cyathea cunninghamii* occurs mainly in sheltered gullies, overtopping *Dicksonia antarctica* (Bostock, 1998) at low altitudes (0-150m). The species is uncommon. It occurs in mixed forest (*Eucalyptus obliqua*/*Eucalyptus regnans* overstorey with callidendrous rainforest understorey) and in gallery scrub (DEH, 2003).

Australia: It occurs in south-east Queensland, north-east New South Wales, southern Victoria and Tasmania (Bostock, 1998). It is listed as Rare both throughout Australia (DSE, 2002) as well as particularly in Queensland (State of Queensland, 2001) and in Victoria (DSE, 2002). It was recently listed as endangered in Tasmania (DPIWE, 2003)

French Polynesia: Reported from the Tuamotu Islands (UNEP-WCMC Species database).

New Zealand: It occurs on the North Island, mountains of the east coast and interior and Auckland (Allan, 1961). It ranges from Mangonui to Fiordland and the Chatham Islands, although it is largely confined to the damper west coast of both main islands (Salmon, 1980). On the north island it occurs from Kaitia to Wellington but is only locally common in the damper western parts (Brownsey and Smith-Dodsworth, 1989). Scattered populations occur in coastal forests along the north and west coasts of the South Island (Brownsey and Smith-Dodsworth, 1989). It favours damp gullies or riverbanks in lowland to montane forest (Brownsey and Smith-Dodsworth, 1989). Reported as Lower Risk near threatened (Given, 1995) and as not threatened (NZERN, 2004)

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INTERNATIONAL TRADE

Gross Exports of *Cyathea cunninghamii*

Exporter	Term	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
New Zealand	dried plants	0	0	0	0	0	0	0	0	1	3	0
Australia	live	0	0	0	0	0	0	0	0	0	20	0
New Zealand	live	0	0	0	0	0	4	377	525	1885	1313	3241
New Zealand	timber	0	0	0	0	0	0	500	0	0	67456	0

6. *Cyathea dealbata*

FAMILY	CYATHEACEAE
NAME AND AUTHOR	<i>Cyathea dealbata</i> (Forst. 1786) Sw. 1801
COMMON NAME	Silver Tree Fern
SYNONYMS	<i>Alsophila tricolour</i> (Colenso 1883) R.Tryon 1970 <i>Cyathea tricolour</i> Colenso 1883 <i>Hemitelia falciloba</i> Colla 1892

DISTRIBUTION AND LOCAL CONSERVATION STATUS

This subcanopy species grows to 10 m. A popular tree fern, well known for the silvery white undersides to the fronds and stipes (Jones, 1987). It requires abundant water (Jones, 1987). It is more common in drier forest and more open scrub (Brownsey and Smith-Dodsworth, 1989).

New Zealand: Occurrence reported in New Zealand (Crowe, 1994) where it is endemic (Anon., 2003; Brownsey and Smith-Dodsworth, 1989). It is a common species in primary indigenous forests (Lehmann *et al.*, 2002). It also occurs in lowland and montane forest from North Cape to Dunedin but it is largely absent from the west coast and far south of the South island (Brownsey and Smith-Dodsworth, 1989). It is common throughout the North, South and Chatham Islands in forest and sometimes in scrub from sea level to 600 m (Salmon, 1980).

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INTERNATIONAL TRADE

Gross Exports of *Cyathea dealbata*

Exporter	Term	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
New Zealand	dried plants	0	0	0	0	192	0	1	0	0	0	0
New Zealand	live	0	0	0	15	100	18	668	685	913	536	4256
New Zealand	timber	0	0	0	0	0	0	195	0	0	0	0

7. *Cyathea medullaris*

FAMILY	CYATHEACEAE
NAME AND AUTHOR	<i>Cyathea medullaris</i> (G. Forster) Swartz, 1801
COMMON NAME	Black Tree Fern

SYNONYM *Alsophila extensa* R. Br., 1810; *Alsophila extensa* (Forst.) Spr., 1827; *Alsophila marianna* Gaud., 1827; *Cyathea affinis* Hook. & Baker, 1865; *Cyathea cumingii* Baker, 1874; *Cyathea deorsilobata* Copel., 1911; *Cyathea extensa* (Forst.) Sw., 1801; *Cyathea grantii* Copel., 1932; *Cyathea medullaris* var. *polyneuron* (Col.) ?; *Cyathea polyneuron* Col., 1879; *Cyathea scabra* Baker, 1876; *Cyathea societarium* Baker, 1874; *Hemitelia cumingii* Trevis., 1851; *Hemitelia extensa* (Forst.) C. Presl, 1848; *Polypodium medullare* G. Forster, 1786; *Sphaeropteris medullaris* (Forst.) Bernh., 1801

DISTRIBUTION AND LOCAL CONSERVATION STATUS

A splendid robust tree fern, renowned for its massive head covered with black scales and huge, spreading crown of lacy fronds, it is adaptable and easy to grow (Jones, 1987). It prefers damp areas and is sensitive to frost (Brownsey and Smith-Dodsworth, 1989).

Australia: Occurrence reported in New South Wales, Tasmania and Victoria (Allan, 1961).

Fiji: Occurrence reported (Jones, 1987).

French Polynesia: Occurrence reported in the Tubuai Islands (Waldren *et al.*, 1995) and listed as Endangered (Hallé, 1978). Also reported in the Society and Tuamotu Islands.

New Zealand: Occurrence reported (Jones, 1987). It occurs in lowland forest throughout, uncommon east of the divide in south Mamaku (Allan, 1961). It is common in the lowland forest of the North Island, but mostly coastal in the South Island and absent from the drier parts of Canterbury and Otago (Brownsey and Smith-Dodsworth, 1989).

Pitcairn Islands: Reported as Endangered (Waldren *et al.*, 1995).

Samoa: Occurrence reported.

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INTERNATIONAL TRADE

Gross Exports of *Cyathea medullaris*

Exporter	Term	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
New Zealand	dried plants	0	0	0	0	240	100	1	0	12	0	0
Vanuatu	dried plants	0	0	0	0	0	2	0	0	0	0	0
New Zealand	live	0	0	0	4	100	45	621	887	785	501	4391
New Zealand	timber	5	0	0	0	0	0	385	6	0	0	0

8. *Cyathea smithii*

FAMILY CYATHEACEAE

NAME AND AUTHOR *Cyathea smithii* Hook.f., 1854

COMMON NAME Soft Tree Fern

SYNONYMS *Alsophila smithii* (Hook.f.) R. Tryon, 1970, *Hemitelia smithii* (Hook.f.) Hook., 1865; *Hemitelia stellulata* Colla, 1886

DISTRIBUTION AND LOCAL CONSERVATION STATUS

A large tree fern well suited to temperate districts with a cold, moist climate (Jones, 1987).

New Zealand: Occurrence reported (Given, 1992). It is endemic to New Zealand and found in the lowland to montane forests from latitude of 35° southwards (Allan, 1961). It is found in damp places in forests from near sea level to at least 1,000 m from Mangonui south through the North, South, Stewart, Auckland, and Chatham Islands (Salmon, 1980). This species is common throughout New Zealand in montane forest of the North Island and in lowland to montane areas of the South Island (Brownsey and Smith-Dodsworth, 1989). It favours colder, wetter conditions and is the dominant tree fern at higher altitudes and in the far south (Brownsey and Smith-Dodsworth, 1989).

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INTERNATIONAL TRADE

Gross Exports of *Cyathea smithii*

Exporter	Term	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
New Zealand	dried plants	0	72	17	0	168	0	0	0	0	0	0
New Zealand	live	0	56	0	81	102	15	535	348	543	1062	4115
New Zealand	timber	0	72	0	0	0	0	180	0	0	0	0

9. *Cibotium barometz*

FAMILY DICKSONIACEAE

NAME AND AUTHOR *Cibotium barometz* (L.1753) J. Smith 1842

SYNONYMS *Balantium glaucescens* Link, 1841; *Cibotium assamicum* Hook., 1844; *Cibotium baranetz* Christ, 1907; *Cibotium djambianum* Hassk., 1856; *Cibotium glaucescens* (Link) Kunze, 1841; *Cibotium glaucophyllum* C. Presl, 1836; *Cibotium glaucum* J. Smith, 1841; *Dicksonia assamica* (Hook.) Griff., 1849; *Dicksonia barometz* (L.) Hook. & Baker, 1866

DISTRIBUTION AND LOCAL CONSERVATION STATUS

Plants are hardy and easily grown (Jones, 1987).

China: Occurrence reported (Jones, 1987). Status in China reported as Vulnerable and wild plants under State protection (Hong Kong Herbarium, 2004(?)). The species has a relatively widespread distribution, occurring in the valley, edges of the forest in tropical and subtropical zones in China, Indochina and southeast Asia. Its populations are reported to decline due to habitat destruction accelerated by collection for medicinal use. However, hard data are still difficult to attain. Dried rhizome of this species is in demand as medicine. It is known to be in trade and to be collected from the wild. Significant trade surveys in China noted this species as priority for conservation action (HaiNing and Shi Yong, 2003).

Hong Kong: Occurrence reported (UNEP-WCMC database).

India: Occurrence reported (Iwatsuki, 1988; Jones, 1987).

Indonesia: Reported as Rare on Java and occurrence reported on Sumatra.

Japan: Reported as not threatened (Nakaike, 1995).

Malaysia: Occurrence reported (Jones, 1987). This is common in open situations in forest on steep slopes in the hills and mountains, and may be abundant amongst secondary growth in clearings where the forest is regenerating (Piggott, 1988). The hairs, fresh or charred, have been used as a styptic and used to stuff pillows, and the leaves can be used medicinally in case of fainting (Piggott, 1988). Reported as not threatened.

Myanmar: Occurrence reported (Nakaike, 1992) in Tavoy (Beddome, 1883).

Nepal: Occurrence reported.

Papua New Guinea: Reported as Rare (Parris, 1988).

Philippines: Reported as Rare (Amoroso, 1990).

Taiwan: Occurrence reported (Li *et al.*, 1975) and reported as Rare (Taiwan Endemic Species Research Institute, 1995).

Thailand: Recorded as not threatened (Tagawa and Iwatsuki, 1979).

Viet Nam: Occurrence reported (Loc, 1992). Lecup and Quang Tu (2000) report a broad impression that market demand for wild collected specimens is far exceeding the current supply capacity.

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INTERNATIONAL TRADE

Gross Exports of *Cibotium barometz*

Exporter	Term	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
China	derivatives	0	0	0	0	0	0	0	1200	0	0	0
China	derivatives flasks	0	0	0	0	0	0	240	0	10000	423	0
China	derivatives kg	0	0	31000	4000	0	0	0.23	19.26	505	6675.42	1456.976
China	derivatives shipments	0	0	0	0	0	0	10363	1910	1696	2389	0
China	live	0	0	0	0	0	0	720	0	0	0	50
Thailand	live	0	0	0	0	0	0	0	0	27	0	0
China	roots kg	0	4000	16100	328000	17470	0	0	0	0	14200	39400
Viet Nam	roots kg	0	0	7000	210000	50000	0	43000	213000	185000	153000	97000

10. *Pterocarpus santalinus*

FAMILY LEGUMINOSAE

NAME AND AUTHOR *Pterocarpus santalinus* Linn. f.

COMMON NAME(S) Algum, Almug, Saunderswood, Red Sandalwood

GLOBAL CONSERVATION STATUS Endangered B1 + 2de (Oldfield, et al, 1998); Endangered (Walter & Gillett, 1998)

DISTRIBUTION AND LOCAL CONSERVATION STATUS

Occurs mainly in peninsular India, and sporadically in other states (Anon., 1997). Seed germination studies are being carried out in the field and *in vitro* for *Pterocarpus santalinus*. *In vitro* propagation protocols are being developed for *P. santalinus* (DBT, 2003).

China: Uncertain status reported (International Legume Database & Information Service, 2003) but likely to be introduced (Kumar and Sane, 2003).

India: Red sandalwood is restricted to the southern parts of the Eastern Ghats where it occurs in dry deciduous forest. It has a restricted natural range and grows typically on dry, hilly, often rocky ground and occasionally found growing on precipitous hillsides at altitudes of 150 - 900 m (Anon., 1997). It is found in the Cuddapah region in southern Andhra Pradesh (ENVIS, 2003), and also in Tamil Nadu and Pondicherry (Kumar and Sane, 2003). Recorded as Endangered (Ved, 1995). Threats to this species include habitat loss and degradation, selective logging, and clear cutting (CAMP Workshops on Medicinal Plants in India 1996). It is commercially valuable for its timber and for the extraction of dye, medicine and cosmetics, and has been overexploited in the past. It has been described by UNDP (2003) as an important plant species of medicinal value in the southern region of India and assessed as being endangered. Although export from India is prohibited by national legislation, large quantities are exported regularly (Anon., 1997). Illegal trade has been reported though exact figure unknown (Anon., 1997).

Pakistan: Occurrence reported (Richter and Dallwitz, 2002) but likely to be introduced (Kumar and Sane, 2003).

Sri Lanka: Occurrence reported as an introduction (Kumar and Sane, 2003).

Taiwan: Occurrence reported as an introduction (Kumar and Sane, 2003).

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INTERNATIONAL TRADE

Gross Exports of *Pterocarpus santalinus*

Exporter	Term	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
India	extract kg	0	0	0	0	0	0	0	2497	0	0	0
Cambodia	timber m ³	0	0	0	0	0	0	0	29.884	0	0	0
Madagascar	timber m ³	0	0	0	0	0	0	0	0	20	0	0

11. *Bletilla striata*

FAMILY ORCHIDACEAE

NAME AND AUTHOR *Bletilla striata* (Thunb.) Rchb.f.

SYNONYMS *Bletia gebina* Lindl., *Bletia hyacinthina* (Sm.) Aiton, *Bletia striata* (Thunb.) Druce, *Bletilla elegantula* (Kraenzl.) Garay & G. A. Romero, *Bletilla gebina* (Lindl.) Rchb.f., *Bletilla striata* f. *gebina* (Lindl.) Ohwi, *Bletilla striata* var. *gebina* (Lindl.) Rchb.f., *Bletilla striata* var. *kotoensis* (Hayata) Masam., *Calanthe gebina* (Lindl.) Lindl., *Coelogyne elegantula* Kraenzl., *Cymbidium hyacinthinum* Sm., *Cymbidium striatum* (Thunb.) Sw., *Epidendrum striatum* (Thunb.) Thunb., *Gyas humilis* Salisb., *Jimensia nervosa* Raf., *Jimensia striata* (Thunb.) Garay & R. E. Schult., *Limodorum hyacinthinum* (Sm.) Donn, *Limodorum striatum* Thunb. in J. A. Murray, *Polytoma inodora* Lour. ex Gomes, *Sobralia bletioides* Brongn. ex Decne.

DISTRIBUTION AND LOCAL CONSERVATION STATUS

China: Occurrence reported in Central, Northern and Southern China (Royal Botanic Gardens, Kew, 2003).

Japan: Occurrence reported (Royal Botanic Gardens, Kew, 2003). Reported as rare in Honshu, Shikoku and Kyushu (Ohwi, 1965).

Korea, Rep. of: Occurrence reported (Royal Botanic Gardens, Kew, 2003; Tchang, 1989).

Lao P.D.R.: Seidenfaden (1973) noted that Gagnepain and Guillaumin (1932-1934) reported its occurrence in northern Laos.

Taiwan: Recorded from Lanyu Island (Liu and Su, 1978).

Viet Nam: Seidenfaden (1973) referred to a specimen in the Paris Museum labelled "Cochinchina? Cult.?".

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INTERNATIONAL TRADE

Gross Exports of *Bletilla striata*

Exporter	Term	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
China	derivatives kg	0	0	0	0	7600	0	0	30005	2	0	0
China	derivatives shipments	0	0	0	0	0	0	0	130	0	0	0
China	dried plants kg	0	0	0	0	0	0	0	198	300	0	0
China	live	0	0	0	0	5	0	0	0	0	0	3000
Viet Nam	live	0	0	0	0	0	0	17	0	0	0	0

12. *Dendrobium nobile*

FAMILY ORCHIDACEAE

NAME AND AUTHOR *Dendrobium nobile* Lindl.

SYNONYMS *Dendrobium coerulescens* Wall. ex Lindl., *Dendrobium formosanum* (Rchb.f.) Masam., *Dendrobium lindleyanum* Griff., *Dendrobium nobile* Lindl. var. *alboluteum* Huyen & Aver., *Dendrobium nobile* var. *formosanum* Rchb.f., *Dendrobium nobile* Lindl. f. *nobilius* (Rchb.f.) M. Hiroe, *Dendrobium nobile* Lindl. var. *nobilius* Rchb.f.

DISTRIBUTION AND LOCAL CONSERVATION STATUS

Bhutan: Occurrence reported (Roberts *et al.*, 1997). Status reported as Rare (Pradhan, 1993).

China: Occurrence reported (Roberts *et al.*, 1997).

India: Occurrence reported (Roberts *et al.*, 1997). Status reported as Indeterminate (Arora and Gupta, 1983).

Lao P.D.R.: Occurrence reported (Roberts *et al.*, 1997).

Myanmar: Occurrence reported (Roberts *et al.*, 1997).

Nepal: Occurrence reported (Roberts *et al.*, 1997).

Taiwan: Occurrence reported (Roberts *et al.*, 1997). Liu and Su (1978) reported that it was probably not a native species.

Thailand: Occurrence reported (Roberts *et al.*, 1997). Identified as a priority for conservation action following a workshop considering orchids in trade in Thailand (Royal Botanic Gardens Kew, 1999).

Viet Nam: Occurrence reported (Roberts *et al.*, 1997).

The variety *alboluteum* is only found in Viet Nam, but *nobile* occurs in all countries listed above (Roberts *et al.*, 1997).

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INTERNATIONAL TRADE

Gross Exports of *Dendrobium nobile*

Exporter	Term	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
China	Derivatives	18000	0	0	0	0	0	0	600	0	0	0
China	Derivatives kg	0	0	0	0	1000	0	0	0	56	3049.7	6.15
China	Derivatives shipments	8629	92	145	0	0	0	0	0	655	320	0
Viet Nam	Derivatives kg	0	0	0	0	5000	0	0	0	0	0	0
Viet Nam	Dried plants kg	0	0	0	0	0	0	20000	67000	0	16500	22000
China	Extract flasks	0	0	0	0	0	0	0	0	0	1	0
China	Live	0	10	0	0	0	0	0	0	0	0	0
Thailand	Live	123	459	13099	747	835	477	0	0	0	0	0
Viet Nam	Live	0	0	0	0	0	250	400	1776	130	0	0
China	Roots kg	0	1000	0	0	0	0	0	0	0	0	0
Laos	Roots kg	0	0	0	0	0	0	0	0	0	400000	0
Viet Nam	Roots kg	0	0	0	28175	0	24500	39000	0	23000	13000	0

13. *Cistanche deserticola*

FAMILY	SCROPHULARIACEAE
NAME AND AUTHOR	<i>Cistanche deserticola</i> Y. C. Ma
COMMON NAME	Desert living cistanche

DISTRIBUTION AND LOCAL CONSERVATION STATUS

China: Occurrence reported from Nei Monggol Zizhiqu and Xinjiang Uygur Zizhiqu (National Environment Protection Bureau, 1987) and recorded as Endangered (Fu and Jin, 1992). "This species is a unique parasitic herb, distributed in Gansu, Shaanxi provinces, Xingjiang Uygur Autonomous Region, Ningxia Hui Autonomous Region, Inner Mongolia Autonomous Region of China" (CITES Secretariat, 2000).

Comments from the proposal submitted by China to list the species include: "Because *Cistanche deserticola* Ma is a parasitic herb growing on the roots of *Haloxylon ammodendron* and *H. persicum* in desert areas. It is difficult to cultivate *Cistanche deserticola* Ma and to develop the population quickly.... Inner Mongolia Autonomous Region is the top native producing area of the species where the quantity of the drug is the best of all; the annual production is about 70 tons at present. *Cistanche deserticola* Ma produced in Ningxia Hui Autonomous Region is used only in the local region in recent years. It is produced in Gansu province for a long time, but the production decreased quickly for indiscriminate collection. This species distributes widely in North Xingjiang Uygur Autonomous Region where annual output is about 50 tons..... The population of the species decreased, distributive area shrunk, resource deposit declined..... For over exploitation, the population of this species was getting less and less and its distributive areas shrunk dramatically. In addition, people collected it only, but not propagate it. Now it is difficult to find the herb in 20km region around the residential area in Inner Mongolia Autonomous Region and in 100km region around the residential area in Xingjiang Uygur autonomous region" (CITES Secretariat, 2000).

"Legal trade: The commodity of the species mainly exported to Japan, Hongkong, and Southeast Asia. The world trade volumes has grown stably. From fifties to sixties, the commodity of *Cistanche deserticola* Ma was mainly collected in Inner Mongolia, and purchases were more than sales all the time. From nineteen seventies, because of over exploitation, the resource in Inner Mongolia Autonomous Region decreased gradually, and the resource in Xingjiang Uygur Autonomous Region was not developed to utilize, the purchase tended to decline. With the utilization of *Cistanche deserticola* Ma in Xingjiang Uygur Autonomous Region, purchase rose obviously. The annual purchases have kept 400-500 tons at the beginning of eighties, and world trade volumes were up to 120 tons per year. With increase of the world trade volumes, the resource of the species decreased dramatically. The world trade volumes is intending to decline in recent years, and now the whole volumes of *Cistanche deserticola* Ma even can't meet the foreign market" (CITES Secretariat, 2000).

"Illegal Trade: Considering its obvious effects and high demand in national and international markets, it is traded in smuggling and other illegal methods" (CITES Secretariat, 2000).

Mongolia: Reported as Endangered (Batjargal and Enkhbat, 1998).

"Famous and valuable Chinese medicinal plants, such as *Cistanche deserticola* and *Cynomorium songaricum*, have decreased in wild habitats as the result of overcollecting...Recently, government bans on hunting and collecting rare and endangered animals and plants have been enacted, but poaching and collecting are still serious problems" (Anon., 1995).

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INTERNATIONAL TRADE

Gross Exports of *Cistanche deserticola*

Exporter	Term	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
China	derivatives	0	0	0	0	0	0	0	0	0	0	1
China	derivatives kg	0	0	0	0	0	0	0	0	4200	0	1233.046
China	derivatives shipments	0	0	0	0	0	0	0	0	0	0	1
China	stems kg	0	0	0	0	0	0	0	0	0	3750	2589.28

14. *Cyclamen coum*

FAMILY PRIMULACEAE

NAME AND AUTHOR *Cyclamen coum* Mill.

SYNONYMS *Cyclamen coum* Mill. ssp. *caucasicum* (K. Koch) O. Schwarz
Cyclamen coum Mill. ssp. *coum* forma *albissimum* R. H. Bailey, Koenen, Lilywh. & P. J. M. Moore
Cyclamen coum Mill. ssp. *coum* forma *pallidum* Grey-Wilson
Cyclamen coum Mill. ssp. *elegans* (Boiss. & Bhuse) Grey-Wilson

DISTRIBUTION AND LOCAL CONSERVATION STATUS

A highly variable species. Has a wide, through discontinuous distribution from Bulgaria in eastern Europe, through northern and central Turkey to the southern Caucasus and northern Iran and then southwards to Syria and the Lebanon. The species also has a wide altitudinal range from sea-level to over 2,100 m. Along the shores of the Black Sea it is a common plant. At higher altitudes it is typically a woodland plant or a plant of scrub or rock crevices (Grey-Wilson, 1988).

It is of economic importance as an ornamental plant (GRIN, 2003).

Armenia: Occurrence reported (Davis *et al.*, 1999).

Azerbaijan: Occurrence reported (Davis *et al.*, 1999).

Bulgaria: Occurrence reported in the east (Davis *et al.*, 1999). It is considered endangered in Bulgaria (P. Zhelev, Aug 2002, in Kathe *et al.* 2003. Information sourced from the RDB of Bulgaria and from official orders of Ministry of Environment and Water).

Georgia: Occurrence reported (Davis *et al.*, 1999).

Iran: Occurrence reported (Davis *et al.*, 1999; Rechinger, 1965).

Israel: Occurrence reported in the north (Davis *et al.*, 1999). It occurs in the shade of shrubs, at altitudes of 1,100-1,200 m. It is found in Upper Galilee, Golan, where it is rather rare; it is protected by law, and grown for ornament in pots and rock gardens (Feinbrun-Dothan, 1978).

Lebanon: Occurrence reported (Davis *et al.*, 1999).

Russian Federation: Occurrence reported (Davis *et al.*, 1999).

Syria: Occurrence reported in the west (Davis *et al.*, 1999).

Turkey: Occurrence reported (Davis, 1978; Davis *et al.*, 1999). The Turkish First National Report to the Convention on Biological Diversity (www.biodiv.org) notes the following: *C. coum* is very restricted to certain regions and affects the economical structure of those regions because there are so many native people who collect geophytes from the mountains.

Ukraine: Occurrence reported (Shishkin and Bobrov, 1952). It occurs in mountain woods, mostly oak (Shishkin and Bobrov, 1952).

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INTERNATIONAL TRADE

Gross Exports of live *Cyclamen coum* and *Cyclamen coum* ssp. *caucasicum*

Exporter	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Georgia	0	0	0	0	0	0	0	0	0	200060	400200
Netherlands	675	0	0	1050	0	0	0	0	0	0	0
Turkey	69750	152650	125800	79545	98025	140000	210400	250000	250000	300000	300000

15. *Cyclamen hederifolium*

FAMILY PRIMULACEAE

NAME AND AUTHOR *Cyclamen hederifolium* Aiton

SYNONYMS *Cyclamen hederifolium* Aiton var. *confusum* Grey-Wilson
Cyclamen hederifolium Aiton var. *hederifolium* forma *albiflorum* (Jord.) Grey-Wilson

DISTRIBUTION AND LOCAL CONSERVATION STATUS

Has a wide Mediterranean distribution, being found from south-east France eastwards to south Turkey, including many Mediterranean islands, but excluding Cyprus.

Albania: Occurrence reported (Davis *et al.*, 1999).

Bulgaria: Occurrence reported (Davis *et al.*, 1999).

France: Occurrence reported (Davis *et al.*, 1999).

Greece: Occurrence reported (Davis *et al.*, 1999).

Italy: Occurrence reported (Davis *et al.*, 1999).

Serbia & Montenegro: Occurrence reported (Davis *et al.*, 1999).

Switzerland: Occurrence reported (Davis *et al.*, 1999).

Turkey: Occurrence reported in the west (Davis, 1978; Davis *et al.*, 1999). The Turkish First National Report to the Convention on Biological Diversity (www.biodiv.org) notes the following: *C. hederifolium* is very restricted to certain regions and affects the economical structure of those regions because there are so many native people who collect geophytes from the mountains.

"In some Near East countries (e.g.Turkey), bulbous plants are used for ornaments as well as in pharmaceutical and cosmetic industries. They have traditionally been used in the floristic trade locally and are now also being sold abroad. The export of flowers earned US\$2,374,000 in 1995. Some of the most important bulbous plants are: *Eranthis hyemalis*, *Anemone blande*, *Leucozum aestivum* and *Cyclamen hederifolium*" (Heywood, 1997).

United Kingdom: Occurrence reported as an introduced species (Davis *et al.*, 1999).

Grey-Wilson (1988) refers to *C. hederifolium* forma *album* (syn. 'Album') as being scarce in wild populations but widely cultivated in gardens; however, he queries the use of the name and it is not listed in Davis *et al.* (1999). Extremely variable. Will grow in almost any garden and sows itself around freely. The best known hardy *Cyclamen*, in cultivation at least since the sixteenth century. Specimens over 130 years old have been recorded.

It is of economic importance as an ornamental plant (GRIN, 2003).

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INTERNATIONAL TRADE

Gross Exports of live *Cyclamen hederifolium* and *Cyclamen hederifolium* var. *hederifolium* fa. *hederifolium*

Exporter	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Netherlands	5276	1000	195	35850	0	0	800	0	0	0	0
Turkey	1184375	1651000	1499228	474890	1094300	1315000	1452532	1441850	1250000	1300000	1275000

16. *Nardostachys grandiflora*

FAMILY	VALERIANACEAE
NAME AND AUTHOR	<i>Nardostachys grandiflora</i> DC.
COMMON NAME	Himalayan spikenard, Jatamansi

DISTRIBUTION AND LOCAL CONSERVATION STATUS

Recorded as occurring from Uttaranchal to south-west China (Polunin and Stainton, 1984) on rocks, ledges and open slopes from 3,600-4,800 m. It is widely distributed on undisturbed slopes (3,000 – 5,000 m) of the Himalayas (Anon., 1997b). Populations have declined in some parts of its range due to over-harvesting of the species's rhizomes for use in traditional medicine and as ingredients in perfumes and oils (Mulliken, 2000).

Afganistan: Occurrence reported (Anon., 1997b).

Bhutan Status recorded as Vulnerable (Pradhan, 1993). "May 25, 198? The Director of Forests approved a proposal to ban exports of medicinal plants..." (Anon., 1997a). "Particularly highly-prized plants, such as *Nardostachys grandiflora*, have been pushed to the brink of extinction by over-exploitation, according to Tinley Tshitila, a Research Officer in the Medicine and Aromatic Plants Section at the Yusipang National Agricultural Research Centre near Thimphu, the capital of Bhutan. "Demand, particularly from India, is so high that we banned exports, except in semi-processed form, so that we can try to control the trade and make sure our farmers benefit." Also, Bhutan has introduced a regime of sustainable harvesting from the wild. Using the traditional trading system, specialists worked with farmers to explain and encourage less-damaging collection. The most exploited area was Lingzhi, but now collection is permitted, in rotation, in other areas - Bumthang and Eastern Trashigang - too" (Emmett, 2003). Domestically, it is used to manufacture incense and in the preparation of indigenous medicine. Collection of this species from the wild is permitted, although exports of this species are banned (Mulliken, 2000).

China: Occurrence reported in Xizang Zizhiqu (Hara *et al.*, 1978-1982). Domestically it is not considered to be commonly used in traditional medicine (Mulliken, 2000).

India: Occurrence reported (Jain and Rao, 1983). Recorded in Himachal Pradesh, on alpine rocky slopes in Manjiban, Jakha-Kanda, Tangankhai and the Great Himalayan National Park, between 3,000 and 4,000 m. The market rate for the rhizomes was Rs. 90-160 per kg (Chauhan, 1999). Also recorded from Uttaranchal (Polunin and Stainton, 1984) and Sikkim (Chauhan, 1999). Domestically it is widely used as medicine and in perfumeries. Domestic harvest is permitted, except in Uttaranchal where it is banned. Exports and re-exports of this species in its raw form are prohibited (Mulliken, 2000).

Myanmar: Occurrence reported (Anon., 1997b).

Nepal: Recorded as Vulnerable (Shrestha and Joshi, 1996) due to extensive collection for export. Legally protected (export of raw material banned, processed material may be exported under licence) under the Forest Regulations, 1995 (amended in 2001) "NTFPs, especially medicinal plants from which underground parts (root, rhizome, tuber) and bark are collected, are adversely affected by uncontrolled harvesting. For example, there has been drastic depletion of plants that were once very abundant, such as *Nardostachys grandiflora* (Jatamansi) from the Jumla area. The medicinal plants of Nepal that are being used in traditional medicinal practised by local communities as well as in the Ayurvedic medical system for primary health care have also been harvested indiscriminately for export to meet international demands. Such plants include *N. grandiflora*" (His Majesty's Government of Nepal Ministry of Forests and Soil Conservation, 2002). Domestically it is used as medicine. Collection is authorised via permits which specify collection area but not quantity or harvest times. Nepal was the primary country of export of this species, exporting large amounts of unprocessed rhizomes and smaller quantities of oil. Much of these were exported to India. Export of unprocessed rhizomes is banned. Mulliken (2000) found little quantitative information available on the impact of harvest levels in Nepal. It is widely collected by villagers and shepherds who visit alpine regions in late summer (Shrestha and Joshi, 1996).

Pakistan: Domestically it is used for medicinal purposes. Commercial exploitation from reserved forests is forbidden. Where it is allowed, it is usually through the sale of the lease of an area.

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INTERNATIONAL TRADE

Gross Exports of *Nardostachys grandiflora* from China

Term	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
roots kg	0	0	0	0	0	0	0	0	0	12500	0

SECTION 2: POSSIBLE CANDIDATE COUNTRY FOR COUNTRY-LEVEL REVIEW OF SIGNIFICANT TRADE

As mentioned in Section 1, following the first step statistical analysis and flow chart method of species selection, an initial list of 49 species was selected as possible candidates for review of significant trade. During the second stage of reviewing all species recorded trade level, a pattern emerged identifying **Viet Nam** as a possible candidate country for a country-level review of significant trade.

Orchidaceae spp. are the main group of species with an increase in trade from Viet Nam in recent years. It appears from the data that, following a ban on export of wild orchids from Thailand, the trade in some of the species was then taken up by Viet Nam, as illustrated by graphs 1-3 below.

Table 1 highlights gross exports of Orchidaceae species from Viet Nam (direct exports only) for the years 1995-2002.

Economy and Environment Program for Southeast Asia (EEPSEA), in their recent Research Report, highlight the main reasons for the rapid growth in this trade in Viet Nam and highlight key failures in the country's attempts to control it. The author of the report did, however, concentrate on fauna, while highlighting the fact that there is also a highly developed illegal trade in plant products in the country (EEPSEA Research Report 2003-RR6, Wildlife Trading in Vietnam: Why it Flourishes, by Nguyen Van Song [Economics and Rural Development Faculty, Hanoi Agricultural University # I, Vietnam]).

http://www.idrc.org.sg/en/ev-47045-201-1-DO_TOPIC.html

Table 4: Gross exports of wild-sourced Appendix II-listed Orchidaceae species from Viet Nam 1994-2002*(Data are shown if the total export for 1995-2002 was equivalent to 50 or more specimens)*

Taxon	Term	Unit	1995	1996	1997	1998	1999	2000	2001	2002	TOTAL
Orchidaceae spp.	live			690	1210	3321	3400	1170	32851	23808	66450
<i>Acampe</i> spp.	live				14	38					52
<i>Acampe carinata</i>	live					105	10	20			135
<i>Acampe rigida</i>	live					105	35	30			170
<i>Acineta superba</i>	live					50					50
<i>Aerides</i> spp.	live		3	6	104	123	1				237
<i>Aerides crassifolium</i>	live					81		50	50		181
<i>Aerides falcatum</i>	live					960		51			1011
<i>Aerides krabiense</i>	live					970	15				985
<i>Aerides multiflorum</i>	live					961	11	151			1123
<i>Aerides odoratum</i>	live					961	13	50			1024
<i>Aerides quinquevulnerum</i>	live					240	15				255
<i>Ania penangiana</i>	live					1	35	20			56
<i>Anoectochilus</i> spp.	live				10	205					215
<i>Anoectochilus sikkimensis</i>	live						15	20		20	55
<i>Arachnis</i> spp.	live		1	2	26	22					51
<i>Arachnis flos-aeris</i>	live					1	40	40			81
<i>Arachnis x maingayi</i>	live					10	40	20			70
<i>Arundina graminifolia</i>	live					53	3				56
<i>Ascocentrum</i> spp.	live				44	5133				100	5277
<i>Ascocentrum christensonianum</i>	live				50	3421	925	1010	1500		6906
<i>Ascocentrum garayi</i>	live		1			1801	30	150			1982
<i>Ascocentrum rubescens</i>	live						1	50			51
<i>Bromheadia aporoides</i>	live							120			120
<i>Bulbophyllum</i> spp.	live		1	13	725	3268	22	100	100	1100	5329
<i>Bulbophyllum blepharistes</i>	live					158					158
<i>Bulbophyllum evrardii</i>	live					20	215	80		10	325
<i>Bulbophyllum frostii</i>	live						740	100			840
<i>Bulbophyllum lepidum</i>	live					139	505	20		470	1134
<i>Bulbophyllum macranthum</i>	live						30	50			80
<i>Bulbophyllum nigrescens</i>	live							100			100
<i>Bulbophyllum picturatum</i>	live							50		20	70
<i>Bulbophyllum putidum</i>	live						750	100		120	970
<i>Bulbophyllum refractum</i>	live					100	30	50		10	190
<i>Bulbophyllum spathulatum</i>	live							50			50
<i>Bulbophyllum umbellatum</i>	live					20	15	50		10	95
<i>Calanthe</i> spp.	live		5		180	50					235
<i>Calanthe triplicata</i>	live									110	110
<i>Christensonia vietnamica</i>	live		5			4531	780	1060		50	6426
<i>Cleisostoma</i> spp.	live		5		160	110					275
<i>Cleisostoma arietinum</i>	live							50			50
<i>Cleisostoma filiforme</i>	live						30	50			80
<i>Cleisostoma fuerstenbergianum</i>	live							50			50
<i>Cleisostoma tenuifolium</i>	live							50			50
<i>Coelogyne</i> spp.	live		2		152	2284	776	50		200	3464
<i>Coelogyne assamica</i>	live						20	50			70
<i>Coelogyne fimbriata</i>	live						70				70
<i>Coelogyne lawrenceana</i>	live					500	20	50	50	10	630
<i>Coelogyne lentiginosa</i>	live					200					200
<i>Coelogyne mooreana</i>	live		100	50		200	560	50			960
<i>Coelogyne nitida</i>	live					400	1				401
<i>Coelogyne rigida</i>	live							50			50
<i>Coelogyne sanderae</i>	live						20	150			170
<i>Coelogyne virescens</i>	live					6	25	50		10	91

Taxon	Term	Unit	1995	1996	1997	1998	1999	2000	2001	2002	TOTAL
<i>Cymbidium</i> spp.	live		5		724	712	42	20	100		1603
<i>Cymbidium aloifolium</i>	live					10	10			30	50
<i>Cymbidium cyperifolium</i>	live				50						50
<i>Cymbidium eburneum</i>	live						20	100			120
<i>Cymbidium erythrostylum</i>	live						220	340			560
<i>Cymbidium insigne</i>	live						20	50			70
<i>Cymbidium kanran</i>	live					10	20	50			80
<i>Cymbidium munronianum</i>	live					10	20	50			80
<i>Cymbidium schroederi</i>	live					50					50
<i>Cymbidium tracyanum</i>	live					750					750
<i>Dendrobium</i> spp.	dried plants					10000					10000
<i>Dendrobium</i> spp.	dried plants	kg				28000	25000		10000		63000
<i>Dendrobium</i> spp.	live		5	20	472	12352	36	101	250	650	13886
<i>Dendrobium</i> spp.	roots	kg							10000		10000
<i>Dendrobium aduncum</i>	live						500	2280	1500		4280
<i>Dendrobium amabile</i>	live						105	3290	300		3695
<i>Dendrobium anosmum</i>	live		50		100	108	1014	230	100	20	1622
<i>Dendrobium bellatulum</i>	live				100	600	675	50	200	550	2175
<i>Dendrobium brymerianum</i>	dried plants	kg								1000	1000
<i>Dendrobium brymerianum</i>	live					600				230	830
<i>Dendrobium capillipes</i>	live					100		1520	500		2120
<i>Dendrobium cariniferum</i>	live					100		50			150
<i>Dendrobium chlorostylum</i>	live						310	100			410
<i>Dendrobium chrysanthum</i>	live						310	60	50		420
<i>Dendrobium chryseum</i>	live						10	50			60
<i>Dendrobium chrysotoxum</i>	live				100	500	1	80	50		731
<i>Dendrobium crystallinum</i>	live								100		100
<i>Dendrobium dantaniense</i>	live							50			50
<i>Dendrobium delacourii</i>	live		50					50	200		300
<i>Dendrobium densiflorum</i>	live						10	50	150		210
<i>Dendrobium devonianum</i>	live							50			50
<i>Dendrobium dickasonii</i>	live							50			50
<i>Dendrobium draconis</i>	live				100	300	10	1550	1600		3560
<i>Dendrobium falconeri</i>	live					200					200
<i>Dendrobium farmeri</i>	live				100	600	1020	50			1770
<i>Dendrobium fimbriatum</i>	live							50			50
<i>Dendrobium formosum</i>	live						230	2085	1700		4015
<i>Dendrobium gibsonii</i>	live						300	140			440
<i>Dendrobium gratiosissimum</i>	live				100			50			150
<i>Dendrobium hancockii</i>	live							50			50
<i>Dendrobium harveyanum</i>	live							1300		200	1500
<i>Dendrobium herbaceum</i>	dried plants	kg				23000				11000	34000
<i>Dendrobium herbaceum</i>	roots	kg						35000			35000
<i>Dendrobium hercoglossum</i>	live							50			50
<i>Dendrobium infundibulum</i>	live							50	50		100
<i>Dendrobium lindleyi</i>	live					400		1	600	250	1251
<i>Dendrobium moniliforme</i>	dried plants					3700					3700
<i>Dendrobium moniliforme</i>	dried plants	kg				5000					5000
<i>Dendrobium nobile</i>	derivatives	kg		5000							5000
<i>Dendrobium nobile</i>	dried plants	kg				20000	67000		16500	22000	125500
<i>Dendrobium nobile</i>	live				250	400	1776	130			2556
<i>Dendrobium nobile</i>	roots	kg	28175	24500	39000			23000	13000		127675
<i>Dendrobium ochraceum</i>	live						20	50			70
<i>Dendrobium parcum</i>	live					100		20			120
<i>Dendrobium pendulum</i>	live						310	80			390
<i>Dendrobium primulinum</i>	live				100			50			150
<i>Dendrobium secundum</i>	live						1500	1210	1500		4210

Taxon	Term	Unit	1995	1996	1997	1998	1999	2000	2001	2002	TOTAL
<i>Dendrobium sulcatum</i>	live							50			50
<i>Dendrobium thyrsoiflorum</i>	live				100	800	2710	735	300		4645
<i>Dendrobium tortile</i>	live					100	20	30		20	170
<i>Dendrobium unicum</i>	live									350	350
<i>Dendrobium wardianum</i>	live								100	150	250
<i>Dendrobium williamsonii</i>	live								100		100
<i>Dendrochilum</i> spp.	live					350					350
<i>Epigeneium</i> spp.	live					501	200			100	801
<i>Eria</i> spp.	live		5	6	92	149	38			100	390
<i>Eria ornata</i>	live					100					100
<i>Eria thwaitesii</i>	live					100					100
<i>Eulophia</i> spp.	live		5		16	103					124
<i>Gastrochilus</i> spp.	live					204					204
<i>Gastrochilus acaulis</i>	live						20	30			50
<i>Gastrochilus obliquus</i>	live						25	30			55
<i>Geodorum siamense</i>	live					201					201
<i>Habenaria rhodocheila</i>	live					1		20		4000	4021
<i>Holcoglossum subulifolium</i>	live					222	10				232
<i>Hygrochilus parishii</i>	live		1		200	1		20			222
<i>Liparis</i> spp.	live		2		10	204	3				219
<i>Listera</i> spp.	live					100					100
<i>Luisia</i> spp.	live				21	100					121
<i>Oberonia</i> spp.	live		1		42	10	225			100	378
<i>Oberonia dalatensis</i>	live						25	60			85
<i>Oberonia langbianensis</i>	live						25	30			55
<i>Oeceoclades</i> spp.	live					100					100
<i>Ornithochilus difformis</i>	live		1	1		6	45				53
<i>Otochilus fuscus</i>	live		1	1		1	565	20			588
<i>Papilionanthe</i> spp.	live					2	880			380	1262
<i>Papilionanthe pedunculata</i>	live				150	10	50	100			310
<i>Papilionanthe teres</i>	live					200					200
<i>Pecteilis susannae</i>	live					101					101
<i>Phaius</i> spp.	live		5		134	18					157
<i>Phaius flavus</i>	live						60				60
<i>Phaius tankervilleae</i>	live					100					100
<i>Phalaenopsis</i> spp.	live		5	6	160	477	15		100		763
<i>Phalaenopsis amabilis</i>	live					300					300
<i>Phalaenopsis aphrodite</i>	live				50						50
<i>Phalaenopsis chibae</i>	live						15	60			75
<i>Phalaenopsis mannii</i>	live							115		10	125
<i>Phalaenopsis pulcherrima</i>	live				50	6	15				71
<i>Pholidota</i> spp.	live		1		65	278					344
<i>Pholidota articulata</i>	live					10	35	20			65
<i>Pholidota imbricata</i>	live					200	15	10			225
<i>Pteroceras</i> spp.	live					502	450			100	1052
<i>Pteroceras semiteretifolium</i>	live					100	30	30			160
<i>Pteroceras teres</i>	live					1	300	30			331
<i>Renanthera</i> spp.	live				20	202				100	322
<i>Renanthera annamensis</i>	live						275	1860			2135
<i>Renanthera coccinea</i>	live					202	790			30	1022
<i>Rhynchostylis</i> spp.	live		5	6	144	7224	1				7380
<i>Rhynchostylis coelestis</i>	live		50						1000		1050
<i>Rhynchostylis gigantea</i>	live					600		80			680
<i>Rhynchostylis retusa</i>	live								50		50
<i>Saccolabium</i> spp.	live		1	6	50	12	25				94
<i>Sarcanthus</i> spp.	live		1	5	64	15	20				105
<i>Schoenorchis</i> spp.	live		1	3	54	44					102

Taxon	Term	Unit	1995	1996	1997	1998	1999	2000	2001	2002	TOTAL
<i>Schoenorchis gemmata</i>	live					20	36			110	166
<i>Sobralia</i> spp.	live					100					100
<i>Spathoglottis</i> spp.	live		5		40	4	25				74
<i>Staurochilus fasciatus</i>	live			1		3	35	50		10	99
<i>Thrixspermum</i> spp.	live		2	4	30	18					54
<i>Thrixspermum centipeda</i>	live						30	50			80
<i>Thunia alba</i>	live					100					100
<i>Thunia alba</i> var. <i>bracteata</i>	live							50			50
<i>Trias nana</i>	live					100					100
<i>Trichoglottis</i> spp.	live		2	4	29	33	1				69
<i>Uncifera dalatensis</i>	live					301	640				941
<i>Vanda</i> spp.	live		5		526	69	25				625
<i>Vanda denisoniana</i>	live				150	1	16	80	50		297
<i>Vanda lilacina</i>	live					212		30			242
<i>Vanda pumila</i>	live					1		50		250	301
<i>Vandopsis</i> spp.	live			4	574	5		1			584
TOTAL for Orchidaceae spp. live and dried plants (no units)			332	828	7642	77074	25382	24640	45201	33788	214887
TOTAL for Orchidaceae spp. dried plants, roots and derivatives (kg)			28175	5000	24500	115000	92000	58000	49500	34000	406175

Figure 2: Gross exports of live *Dendrobium draconis* from Viet Nam and Thailand

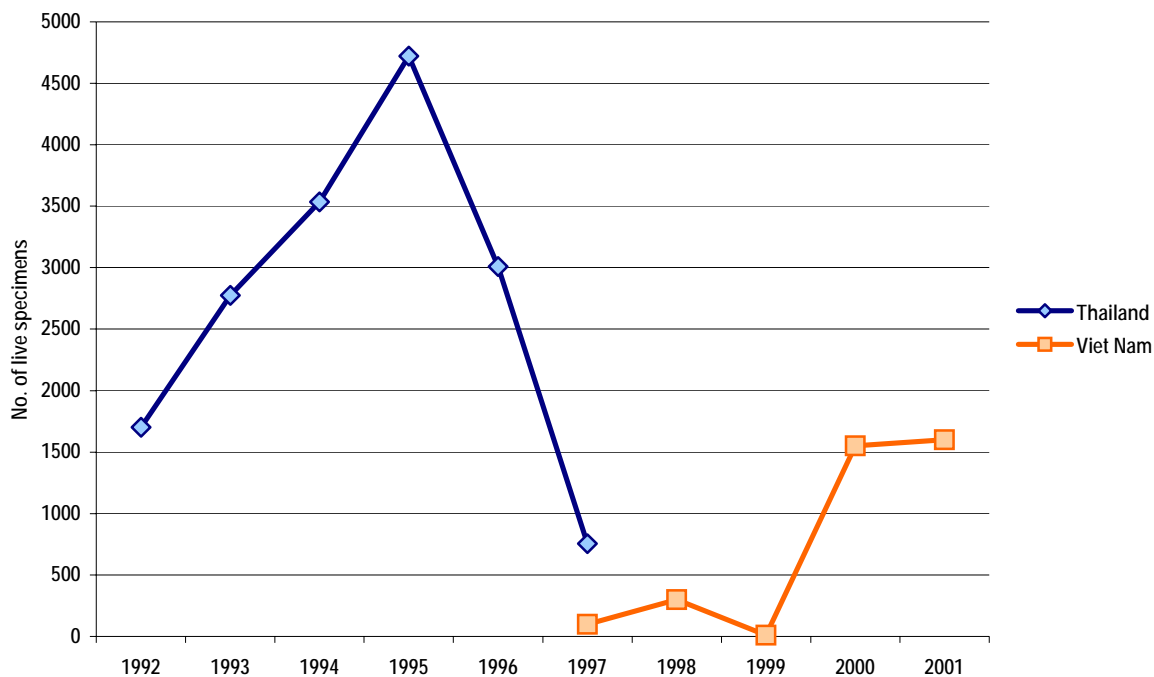


Figure 3: Gross exports of *Dendrobium nobile* from Viet Nam and Thailand

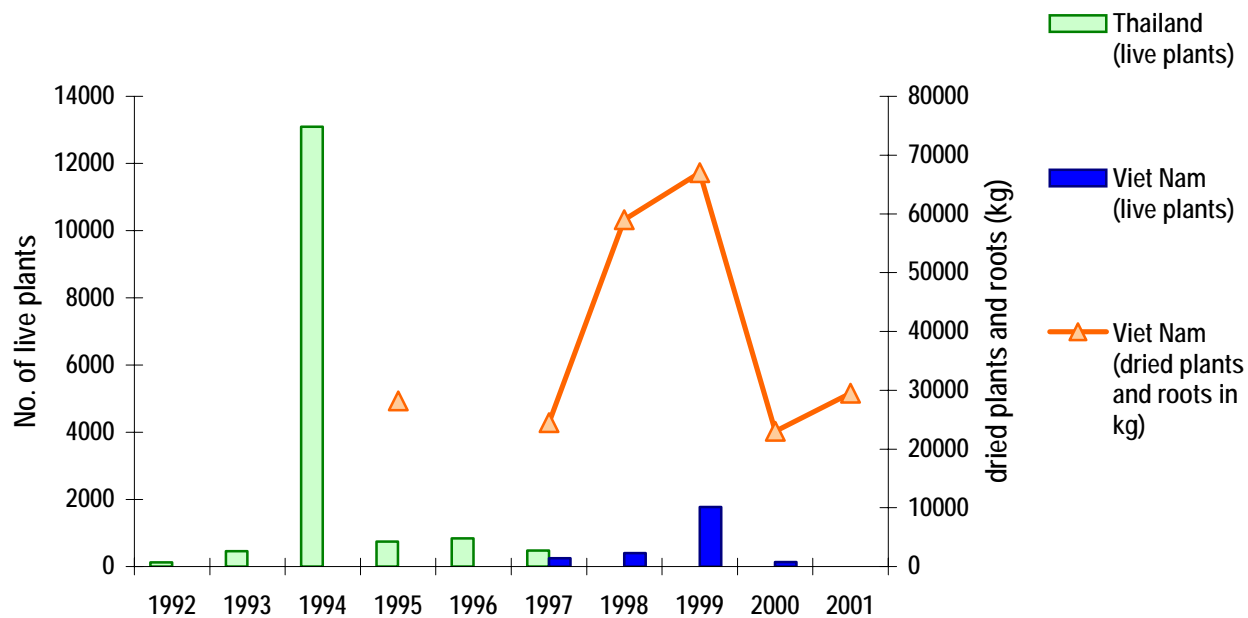


Figure 4: Gross exports of live *Dendrobium secundum* from Viet Nam and Thailand

