CONVENTION SUR LE COMMERCE INTERNATIONAL DES ESPECES
DE FAUNE ET DE FLORE SAUVAGES MENACEES D'EXTINCTION

Quatorzième session du Comité pour les plantes
Windhoek (Namibie), 16 – 20 février 2004

Commerce important de plantes

SELECTION DE NOUVELLES ESPECES

1. Le présent document a été préparé par le Secrétariat.

2. Conformément aux paragraphes b) et c) de la partie *Sélection des espèces à étudier* de la résolution Conf. 12.8 (Etude du commerce important de spécimens d'espèces inscrites à l'Annexe II), le Comité pour les plantes devrait sélectionner pour son étude les espèces dont il faut se préoccuper en urgence. La sélection devrait être fondée sur les niveaux de commerce enregistrés et les informations dont dispose le Comité pour les plantes, le Secrétariat, les Parties ou autres spécialistes pertinents.

3. Le Secrétariat a demandé au PNUE-WCMC de fournir un résumé des données sur le commerce des espèces végétales inscrites à l'Annexe II des cinq années les plus récentes, ainsi que des orientations sur la sélection des espèces à étudier.

4. Le Comité pour les plantes est prié d'examiner *Review of Significant Trade – Analysis of Trade Trends with notes on the conservation status of selected species – Volume 1. Plants*, du PNUE-WCMC (voir en annexe, uniquement en anglais) et de recommander une liste d'espèces pour son étude du commerce important.

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

United Nations Environment Programme
World Conservation Monitoring Centre

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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 sources[1]. 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 exports[2], but excludes data on re-exports for the majority of plant species[3].

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 database[4] 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.
Pericopsis elata	0.66 g/cm^3
Guaiacum sanctum	1.23 g/cm^3
Guaiacum officinale	1.23 g/cm^3
Swietenia humilis	0.61 g/cm^3
Swietenia mahogani	0.75 g/cm^3
Prunus africana	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 Species*[5], 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.

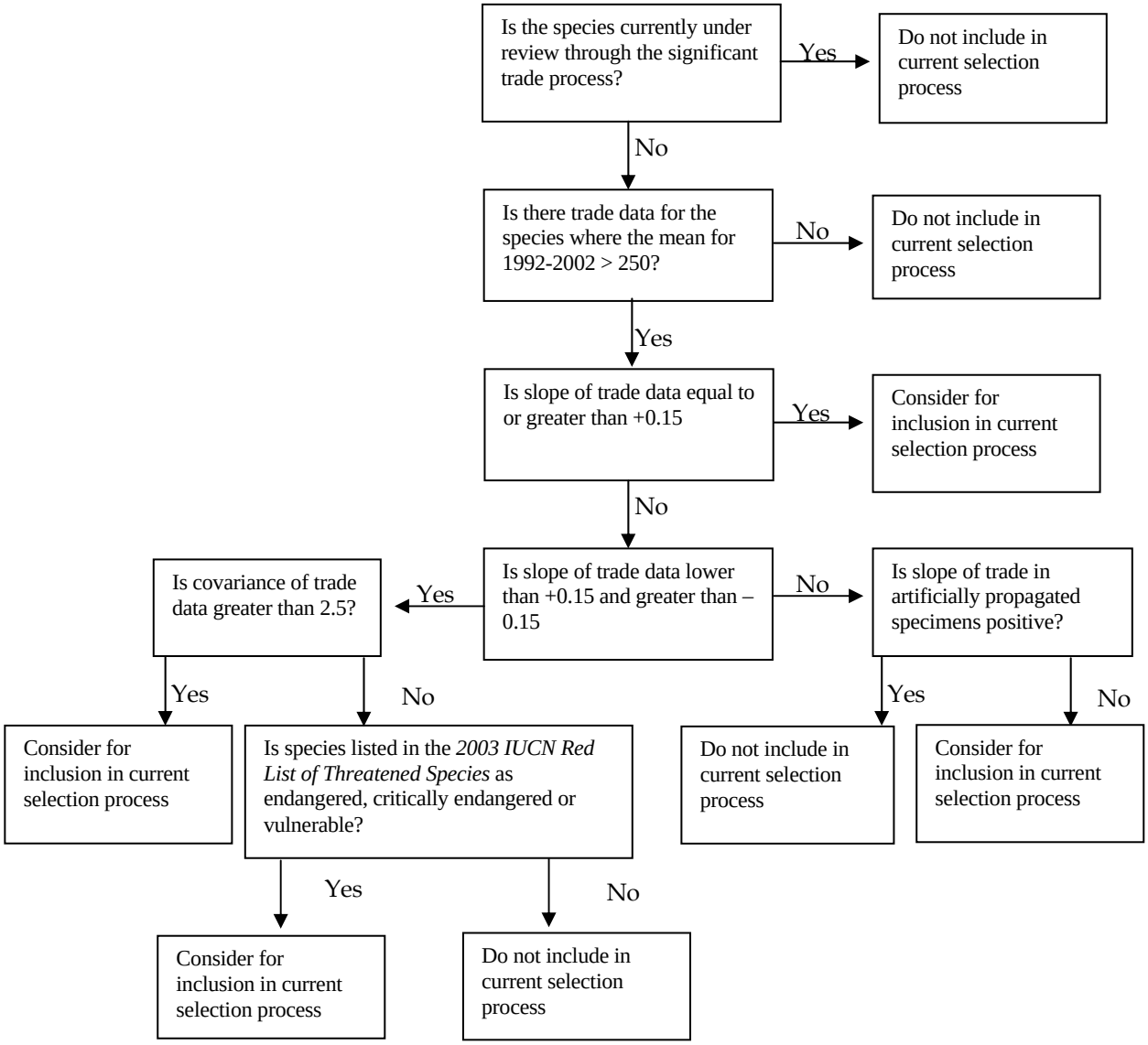
5 IUCN 2003. *2003 IUCN Red List of Threatened Species*. www.redlist.org

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

SPECIES	INCLUDED /EXCLUDED	COMMENT
Habenaria acuifera	EXCLUDED	
Ludisia discolor	EXCLUDED	
Vanilla aphylla	EXCLUDED	
Cyclamen coum	INCLUDED	See species sheet below
Hydrastis canadensis	EXCLUDED	
Bowenia serrulata	EXCLUDED	
Taxus wallichiana	EXCLUDED	
Nardostachys grandiflora	INCLUDED	See species sheet below
Guaiacum officinale	EXCLUDED	Majority of trade is from Mexico where a species management programme is being implemented.
Guaiacum sanctum	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
Galanthus elwesii	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
Panax quinquefolius	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
Cistanche deserticola	INCLUDED	See species sheet below
Cyclamen cilicium	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
Cyclamen hederifolium	INCLUDED	See species sheet below
Picrorhiza kurrooa	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 *P. scrophulariiflora*, 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 *Galanthus woronowii* Losinsk. in Kom.

SYNONYMS *Galanthus ikariae* auct. non Baker, pro parte
Galanthus ikariae ssp. *latifolius* Stern pro parte
Galanthus latifolius 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).

REFERENCES

Anon. (2003). Rare, Endangered and Vulnerable Plants of the Republic of Georgia. Missouri Botanical Garden. http://www.mobot.org/MOBOT/Research/georgia/afamily.shtml#Amaryllidaceae Downloaded on 14/11/2003.
CITES Secretariat. 2002. Proceedings Eleventh Meeting of the Plants Committee, Langkawi, Malaysia 2001. http://www.cites.org/eng/cttee/plants/11/E-Minutes_PC11.pdf
Davis, A. P., McGough, H. N., Mathew, B. and Grey-Wilson, C. (1999). *CITES Bulb Checklist. For the genera:* Cyclamen, Galanthus *and* Sternbergia. The Royal Botanic Gardens, Kew.
Davis, P. H. (ed.) (1984) *Flora of Turkey*. Vol. 8. Royal Botanic Garden, Edinburgh.
Golovanov, V. D. *et al.* (eds.) (1988). *Red Data Book of RSFSR, plants*. Komarov, Moscow: Academy of Sciences of USSR, Botanical Institut of V. L. Rosagropromizdat. 591 pp. Col. illus., maps.
GRIN (2003). The Germplasm Resources Information Network. http://www.ars-grin.gov/cgi-bin/npgs/html/tax_search.pl?galanthus+woronowii Downloaded on 18/12/2003

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 *Podophyllum hexandrum* Royle

COMMON NAME(S) Himalayan may-apple

SYNONYMS *Podophyllum emodi* Honigberger
Podophyllum emodi var. *axillare* Chatterjee & Mukherjee
Podophyllum emodi var. *bhootanense* Chatterjee & Mukherjee
Sinopodophyllum emodi (Honigberger) Ying
Sinopodophyllum hexandrum

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 cotaining podophyllin. Recently investigated as a possible drug used in treatment of cancer” (Polunin and Stainton, 1984).

REFERENCES

Airi, S. Rawal, R. S., Dhar, U. and Puroit, A. N. (2000). Population studies on *Podophyllum hexandrum* Royle – a dwindling, medicinal plant of the Himalaya. International Plant Genetic Resources Institute http://www.ipgri.cgiar.org/publications/pgrnewsletter/10popu.htm Downloaded 22/12/2003.

Anon. (1997). *Biodiversity action plan for Bhutan*. National biodiversity strategy and action plan. 188pp. http://www.biodiv.org/doc/world/bt/bt-nbsap-01-en.pdf

Bhadula, S. K., Singh, A., Lata, H., Kuniyal, C. P. and Purohit, A. N. (2000). Genetic resources of *Podophyllum hexandrum* Royle, an endangered medicinal species from Garhwal Himalaya, India. International Plant Genetic Resources Institute http://www.ipgri.cgiar.org/publications/pgrnewsletter/06podo.htm Downloaded 22/12/2003.

CAMP (1998). Selected Medicinal Plants of Northern, Northeastern & Central India. Conservation Assessment and Management Plan. Hosted by Forest Department of Uttar Pradesh, Lucknow, 21-25 January, 1998. http://www.cbsg.org/reports/exec_sum/indian_med_plants_north_camp.pdf Downloaded 22/12/2003.

Chauhan, N. S. (1999) *Medicinal and aromatic plants of Himachal Pradesh*. Indus Publishing Company, New Delhi.

Ebel, F. (1998). Die Schildblättrigkeit krautiger Angiospermen-Sippen in ihrer Beziehung zu Standort und Verbreitung [The leaf peltation in the herbaceous taxa of Angiosperms in its relation to natural habitat and distribution.] Ergänzung zu dem in der Flora (1998) 193, 203-224. http://www.biologie.uni-halle.de/Botany/schild.html Downloaded 22/12/2003.

Grierson, A. J. C. and Long, D. G. (1984) *Flora of Bhutan, including a record of plants for Sikkim.* Vol. 1 Part 2. Royal Botanic Garden, Edinburgh.

Malla, S. B., Shrestha, A. B., Rajshandari, S. B., Shrestha, T. B., Adhikari, P. M. and Adhikari, S. R. (1976) Flora of Langtang and cross section vegetation survey (Central Zone). *Bull. Dept. Med. Plants Nepal* 6: 273 pp.

Matin, A., Khan, M. A., Ashraf, M. and Qureshi, R. A. (2001). Traditional Use of Herbs, Shrubs and Trees of Shogran Valley, Mansehra, Pakistan. *Pakistan Journal of Biological Sciences* 4 (9): 1101-1107.

Ministry of Agriculture, Royal Government of Bhutan (1993). Schedule 2: list of totally protected plant species. *J. Roy. Soc. Arts.*

Nadeem, M., Palni, L.M.S., Purohit, A.N., Pandey, H., Nandi, S.K. (2000). Propagation and conservation of *Podophyllum hexandrum* Royle: an important medicinal herb. *Biological Conservation*, 92 (1): 121-129.

Polunin, O. and Stainton, A. (1984) *Flowers of the Himalaya*. Oxford University Press, Oxford.

Rao, R. R. (1998). Assessment of biodiversity and infraspecific variation among two reputed medicinal plant genera *Aconitum* L. (Ranuculaceae) and *Podophyllum* L. (Podophyllaceae) in the Himalaya. *ENVIS Bulletin* 6 (2): 16-19. http://www.geocities.com/himenvis/vol62/Summary-vol62.html Downloaded 22/12/2003.

Shrestha, T. B. and Joshi, R. M. (1996) *Rare, endemic and endangered plants of Nepal.* WWF Nepal Program.

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).

REFERENCES

Hunt, D. R. (comp.) (1999). *CITES Cactaceae checklist*. Second Edition. Compiled with assistance of members of the International Organization for Succulent Plant Study. Kew: Royal Botanic Gardens, Kew and International Organisation for Succulent Plant Study. 315pp.

National Parks Service. (2003). Saguaro information sheet. http://www.nps.gov/sagu/guides/saguarocactus.pdf

NatureServe. (2003). NatureServe Explorer: An online encyclopedia of life [web application]. Version 1.8. NatureServe, Arlington, Virginia. http://www.natureserve.org/explorer Downloaded 14/11/2003.

Oldfield, S. (comp.) (1997). *Cactus and succulent plants - Status survey and conservation action plan.* IUCN/SSC Cactus and Succulent Specialist Group. Gland, Switzerland & Cambridge, UK 212pp.

Steenburgh, W. F. and Lowe, C. H. (1977). *Ecology of the Saguaro: II*. National Park Service Monograph Series Number 8. 242pp.

USDA and NRCS (2002). The PLANTS Database, Version 3.5 (http://plants.usda.gov) National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

INTERNATIONAL TRADE

Gross Exports of *Carnegiea igantean*

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).

REFERENCES

Anon. (2003a). The Forest Department, Sarawak, Malaysia. http://www.forestry.sarawak.gov.my/forweb/ourfor/flora/fern/ccont.htm Downloaded 22/12/2003.

Anon. (2003b). History of and Guide to Purwodadi Botanic Garden. http://www.bogor.indo.net.id/kri/phist.htm Downloaded 22/12/2003.

Amoroso, V. B. (1990). Some endangered economic and endemic ferns of the Philippines. Pp. 15-27 in (unknown published source).

Colijn, E. (2000). Nature conservation in Indonesia. http://users.bart.nl/~edcolijn/gede.html Downloaded 22/12/2003.

Jones, D. L. (1987). *Encyclopaedia of ferns, an introduction to ferns, their structure, biology, economic importance, cultivation and propagation.* Lothian Publishing Company PTY Ltd, Melbourne. pp 433.

Kambuou, R. N. (1995). Papua New Guinea: Country Report to the FAO international technical conference on plant genetic resources (Leipzig,1996). http://www.fao.org/WAICENT/FaoInfo/Agricult/AGP/AGPS/pgrfa/pdf/papuanew.pdf Downloaded 22/12/2003.

Le Trong Trai, Le Van Cham, Bui Dac Tuyen, Tran Hieu Minh, Tran Quang Ngoc, Nguyen Van Sang, Monastyrskii, A. L. and Eames, J. C. (1999) *A Feasibility Study for the Establishment of Xuan Lien Nature Reserve, Thanh Hoa Province, Vietnam*. BirdLife International Vietnam Programme, Hano.

Loc, P. K. (1992). Annotations to: WCMC Conservation status listing for Philippines dated 6 April 1992.

Parris, B. S., Beaman, R. S. and Beaman, J. H. (1992). *The plants of Mount Kinabalu. I. Ferns and fern allies.* Royal Botanic Gardens, Kew, UK.

Suzuki, E. (2000). Plant specimens from Kutai National Park, East Kalimantan, Indonesia. http://biodiversity.sci.kagoshima-u.ac.jp/suzuki/Herbarium/HerbEK.htm Downloaded 22/12/2003.

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 *Cyathea cunninghamii* Hook.f.

COMMON NAME(S) Gully Tree Fern, Slender Tree Fern

SYNONYMS *Alsophila cunninghamii* (Hook.f. in Hook., 1854) R.Tryon, 1970;
Cyathea boylei 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 Kaitaia 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)

REFERENCES

Allan, H. H. (1961). *Flora of New Zealand*. Vol 1. R. E. Owen, Government Printer, Wellington, New Zealand. pp 1085.

Bostock, P. D. (1998).Cyatheaceae. In *Flora of Australia*. Vol 48 Ferns, gymnosperms and allied groups (A. E. Orchard and P. M. McCarthy ed.s). pp193-205. ABRS/CSIRO Australia.

Brownsey, P. J. and Smith-Dodsworth, J. C. (1989). *New Zealand ferns and allied plants*. David Bateman, Auckland, New Zealand.

DEH (2003). 2. Tasmanian Tree Ferns. In: Tree Fern Management Plan for the Harvesting, Transporting or Trading of Dicksonia ntarctica in Tasmania July 2001. Department of the Environment and Heritage – Australian Government. http://www.deh.gov.au/biodiversity/trade-use/sources/management-plans/approved/treefern-tas/ Downloaded 02 Jan 2004.

DPIWE (2003). Information on Nominations for Listing Species on the Tasmanian Threatened Species Protection Act 1995. Parks & Wildlife - Department of Primary Industries, Water & Environment of Tasmania. http://www.dpiwe.tas.gov.au/inter.nsf/WebPages/SJON-59V9LR?open. Downloaded on 02 Jan 2004.

DSE (2002). Native Flora. Department of sustainability and the Environment, Victoria, Australia. http://www.nre.vic.gov.au/web/root/domino/cm_da/nrecfor.nsf/0/68bdc676150557b44a25679a00026df4?OpenDocument Downloaded 02 Jan 2004

Given, D. (1995). Personal communication to WCMC concerning conservation status of some New Zealand tree ferns.

Jones, D. L. (1987). *Encyclopaedia of ferns, an introduction to ferns, their structure, biology, economic importance, cultivation and propagation.* Lothian Publishing Company PTY Ltd, Melbourne. pp 433.

NZERN (2004). *Cyathea cunninghamii*. The New Zealand Ecological Restoration Network. http://www.members.bush.org.nz/planterguide/species.cfm?Species=Cyathea%20cunninghamii Downloaded 02 Jan 2004.

Salmon, J. T. (1980). *The native trees of New Zealand*.A. H. & A. W. Reed Ltd, Sydney. pp384.

State of Queensland (2001). Nature Conservation Wildlife Regulation 1994 – reprinted as in force on 7 December 2001. http://www.legislation.qld.gov.au/LEGISLTN/CURRENT/N/NatureConWilR94_02C.pdf Downloaded 02 Jan 2004

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 *Cyathea dealbata* (Forst. 1786) Sw. 1801

COMMON NAME Silver Tree Fern

SYNONYMS *Alsophila tricolour* (Colenso 1883) R.Tryon 1970
Cyathea tricolour Colenso 1883
Hemitelia falciloba 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).

REFERENCES

Anon. (2003). The Hidden Forest: Primitive Plants. http://www.hiddenforest.co.nz/plants/trueferns/trueferns.htm Downloaded 22/12/2003.

Brownsey, P. J. and Smith-Dodsworth, J. C. (1989). *New Zealand ferns and allied plants*. David Bateman, Auckland, New Zealand.

Crowe, A. (1994). *Which native fern? A simple guide to the identification of New Zealand native ferns*. Viking. 64 pp.

Jones, D. L. (1987). *Encyclopaedia of ferns, an introduction to ferns, their structure, biology, economic importance, cultivation and propagation.* Lothian Publishing Company PTY Ltd, Melbourne. pp 433.

Lehmann, A., Leathwick, J. R. and McOverton, J. (2002). Assessing New Zealand fern diversity from spatial predictions of species assemblages. *Biodiversity and Conservation* 11: 2217–2238.

Salmon, J. T. (1980). *The native trees of New Zealand.* A. H. & A. W. Reed Ltd, Sydney.

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 *Cyathea medullaris* (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 societarum* 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.

REFERENCES

Allan, H. H. (1961). *Flora of New Zealand*. Vol 1. R. E. Owen, Government Printer, Wellington, New Zealand. pp 1085.
Brownsey, P. J. and Smith-Dodsworth, J. C. (1989). *New Zealand ferns and allied plants*. David Bateman, Auckland, New Zealand.
Hallé, F. (1978). Arbres et forêts des Iles Marquises. *Cah. Pac.* 21: 315-357.
Jones, D. L. (1987). *Encyclopaedia of ferns, an introduction to ferns, their structure, biology, economic importance, cultivation and propagation.* Lothian Publishing Company PTY Ltd, Melbourne.
Waldren, S., Florence, J. and Chepstow-Lusty, A. J. (1995). Rare and endemic vascular plants of the Pitcairn Islands, south-central Pacific Ocean: a conservation appraisal. *Biological Conservation* 74: 83-98.

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).

REFERENCES

Allan, H. H. (1961). *Flora of New Zealand*. Vol 1. R. E. Owen, Government Printer, Wellington, New Zealand. pp 1085.

Brownsey, P. J. and Smith-Dodsworth, J. C. (1989) *New Zealand ferns and allied plants*. David Bateman, Auckland, New Zealand.

Given, D. R. (1992). Letter to Hugh Synge concerning conservation status of New Zealand plants.

Jones, D. L. (1987). *Encyclopaedia of ferns, an introduction to ferns, their structure, biology, economic importance, cultivation and propagation.* Lothian Publishing Company PTY Ltd, Melbourne.

Salmon, J. T. (1980). *The native trees of New Zealand.* A. H. & A. W. Reed Ltd, Sydney.

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 be 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.

REFERENCES

Amoroso, V. B. (1990). Some endangered economic and endemic ferns of the Philippines. pp. 15-27 in (unknown published source).

Hong Kong Herbarium, 2004(?)). *Cibotium barometz* (L.) J. Sm. http://www.hkherbarium.net/Herbarium/5Cibotium%20barometz.htm Downloaded 02 Jan 2004.

Beddome, R. H. (1883). *Handbook to the ferns of British India, Ceylon and the Malay Peninsula*.Thacker, Spink and Co., London. pp500.

HaiNing, Q. and D. Shi Yong. (2003). Test of the applicability of the criteria for listing on Appendix I and Appendix II. http://www.cites.org/common/prog/criteria/flora/C_barometz_CN.pdf Downloaded on 02 Jan 2004.

Iwatsuki, K. (1988). An enumeration of the pteridophytes of Nepal. Pp. 231-339 *In* Ohba, H. and Malla (eds.). *Himalayan Plants*. Tokyo: Tokyo Press.

Jones, D. L. (1987). *Encyclopaedia of ferns, an introduction to ferns, their structure, biology, economic importance, cultivation and propagation.* Lothian Publishing Company PTY Ltd, Melbourne. pp 433.

Lecup, I. and B. Quang Tu (2000) . A participatory diagnosis of the local non timber forest products and their market environment in two communes in Tua Chua District, Lai Chau Province. Vietnamese – German Technical Cooperation. http://www.mekonginfo.org/mrc_en/doclib.nsf/0/78E25960B87ECA4C472569340035837O/$FILE/FULLTEXT.html Downloaded 02 Jan 2004.

Li, H.-L., T.-S. Liu, T.-C. Huang, T. Koyama & C.E. Devol (1975). *Flora of Taiwan*. Taipei: Epoch

Loc, P. K. (1992). Annotations to WCMC printout entitled: Conservation status listing for Philippines dated 6 April 1992. Unpublished.

Ministry of Science, Technology and Environment (1996). *Sach do Viet Nam Phan Thuc Vat.* [*Red Data Book of Vietnam*] *Volume 2. Plants*. Hanoi: Science and Technics Publishing House. 484 pp.
Nakaike, T. (1992). *New flora of Japan, pteridophytes*. 868 pp.
Nakaike, T. (1995). Annotations to WCMC printout entitled "Conservation status listing of tree ferns of Japan". Unpublished
Parris, B. (1988). List of ferns in the WCMC database for Peninsular Malaysia with annotations by Barbara Parris. Unpublished.
Piggott, A. G. (1988). *Ferns of Malaysia in colour.* Tropical Press SDN. BHD., Kuala Lumpur, Malaysia. pp 458.
Tagawa, M. and Iwatsuki, K. (eds.) (1979). *Flora of Thailand* 3(1):1-128.
Taiwan Endemic Species Research Institute (1995). Conservation Status Listing of Plants in Taiwan (Draft). 79 pp. Unpublished.

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).

REFERENCES

Anon. (1997). Proposal to include *Pterocarpus santalinus* in Appendix II of CITES (unpublished). Ninth Conference of the Parties to CITES, Fort Lauderdale, Florida, USA.

CAMP Workshops on Medicinal Plants in India (1996). *Pterocarpus santalinus.* In: IUCN 2003. *2003 IUCN Red List of Threatened Species.* www.redlist.org. Downloaded 22/12/2003.

Department of Biotechnology (DBT) (2003). Ministry of Science and Technology of India. http://dbtindia.nic.in/r&d/med&aroplants.html Downloaded 22/12/2003.

ENVIS (2003). Environmental Information System - Medicinal Plants of Conservation Concern. Focus on 880 traded medicinal plants of India. http://envis.frlht.org.in/botanical_search.php?txtbtname=Pterocarpus+santalinus&gesp=1764%7CPterocarpus+santalinus+L.F Downloaded 22/12/2003

International Legume Database & Information Service (2003). http://www.ildis.org/LegumeWeb/6.00/taxa/16068.shtml Downloaded 22/12/2003.

Kumar, S. and Sane, P. V. (2003) *Legumes of South Asia, a check-list*. Royal Botanic Gardens, Kew.

Oldfield, S.O., Lusty, C. & A.MacKinven. 1998. *The World List of Threatened Trees.* World Conservation Press. 650pp.

Richter, H. G. and Dallwitz, M. J. (2002). Commercial timbers: descriptions, illustrations, identification, and information retrieval. In English, French, German, and Spanish. Version: 18th October 2002. http://biodiversity.uno.edu/delta/ Downloaded 22/12/2003.

UNDP (United Nations Development Programme) (2003). Environment Programme Support Sub-Programme for Medicinal Plants Conservation and Sustainable Utilisation, India. http://www.undp.org.in/Programme/Environment/mplants/default.htm Downloaded 22/12/2003.

Ved, D. K. (1995). Plants under threat - new list forged. (from FRLHT). *AMRUTH* 5: 2-3.

Walter, K.S. & H.J. Gillett. 1998. *1997 IUCN Red List of Threatened Plants.* Compiled by the World Conservation Monitoring Centre, CambridgeUK. 862pp.

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.) Rchbf., *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., *Limodoru 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.?".

REFERENCES

Royal Botanic Gardens, Kew (2003) Monocot Checklist. http://www.rbgkew.org.uk/data/monocots. Downloaded 24 June 2003.
Gagnepain, F. and Guillaumin, A. (1932-1934) Orchidacées. Pp. 142-647 in Lecomte, *Flore Gén. Indoch.* 6.
Liu, T.-S. and Su, H.-J. (1978) Orchidaceae. Pp. 859-1137 in *Flora of Taiwan*, Vol. 5. Epoch Publishing, Taipei.
Ohwi, J. (1965) *Flora of Japan*.
Seidenfaden, G. (1973) An enumeration of Laotian orchids. *Bull. Mus. Nat. Hist. Nat.* (3)71: 101-152.
Tchang Bok Lee (1989) [*Illustrated flora of Korea*.] (In Korean)

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).

REFERENCES

Arora, Y. K. and Gupta, R. K. (1983). Native ornamental orchids: conservation and cultivation of endangered and extinct species. *J. Econ. Taxon. Bot.* 4 (2):393-411.

Liu, T.-S. and Su, H.-J. (1978) Orchidaceae. Pp. 859-1137 in *Flora of Taiwan*, Vol. 5. Epoch Publishing, Taipei.

Pradhan, R. (1993). Annotations to WCMC plant list for Bhutan dated 31 August 1993.

Roberts, J. A., Allman, L. R., Beale, C. R., Butter, R. W., Crook, K. R. and McGough, H. N. (comps.) (1997). *CITES Orchid Checklist. Volume 2 For the genera*: Cymbidium, Dendrobium *(selected sections only)*, Disa, Dracula *and* Encyclia. Kew: Royal Botanic Gardens. 300 pp.

Royal Botanic Gardens Kew. 1999. A survey of the orchid trade in Thailand. 23pp. http://europa.eu.int/ hail/environment/cites/studies/study_orchids_thailand.pdf

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 *Cistanche deserticola* 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 desertecola 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 desertecola 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 desertecola 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).

REFERENCES

Anon. (1995). *China's Biodiversity: A Country Study*. State Environmental Protection Administration, China. http://www.zhb.gov.cn/english/biodiv/state_imp_en/country_study.html

Anon. (1996). *Biodiversity Conservation Action Plan for Mongolia. Appendix 7 List of plant species classified as very rare and rare under the Mongolian Law on Natural Plants*. Pp. 119-122.

Batjargal, Z. and Enkhbat, A. (editors). (1998). *Biological Diversity in Mongolia. First National Report to the Convention on Biological Diversity*. Ministry for Nature and Environment of Mongolia, UNEP and GEF Ulaanbatar. 144pp. http://www.biodiv.org/doc/world/mn/mn-nr-01-en.pdf

CITES Secretariat. 2000. Proposal 11.59. Consideration of Proposals for Amendment of Appendices: *Cistanche deserticola*. Proposal submitted by The People's Republic of China. http://www.google.co.uk/search?q=cache:i5SI_ZEN_UMJ:www.cites.org/eng/cop/11/prop/59.pdf+%22Cistanche+deserticola%22+status&hl=en&ie=UTF-8

Fu, L. and Jin, J. (eds.) (1992). *China Plant Red Data Book. Rare and endangered plants. Vol. 1*. Beijing: Science Press. xviii, 741 pp.

IUCN & TRAFFIC. 2000. Analysis of proposals to amend the CITES Appendices. Submitted to the Eleventh Meeting of Conference of the Parties Nairobi, Kenya 10-20 April 2000. Unpublished.

National Environment Protection Bureau (1987). *The list of rare and endangered plants protected in China*. Botanical Institute of Chinese Academy of Sciences, Beijing: Academy Press. 96 pp.

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).

REFERENCES

Davis, A. P., McGough, H. N., Mathew, B. and Grey-Wilson, C.. (1999). *CITES Bulb Checklist. For the genera:* Cyclamen, Galanthus *and* Sternbergia. The Royal Botanic Gardens, Kew. 87pp.

Davis, P. H. (ed.) (1978) *Flora of Turkey*. Vol. 6. Royal Botanic Garden, Edinburgh.

Feinbrun-Dothan, N. (1978). *Flora Palaestina*. Part Three, Text Ericaceae to Compositae. The Israel Academy of Science and Humanities, Jerusalem.

Grey-Wilson, C. (1988). *The Genus* Cyclamen. The Royal Botanic Gardens, Kew in association with Christopher Helm and Timber Press. 147 pp.

GRIN (2003). The Germplasm Resources Information Network. http://www.ars-grin.gov/cgi-bin/npgs/html/tax_search.pl?cyclamen+coum Downloaded on 18/12/2003.

Rechinger, K. H. (1965). *Flora Iranica*, *Flora des Iranischen hochlandes und der umrahmenden gebirge*. Primulaceae. Akademische Druck- u. Verlagsanstalt, Graz, Austria. 37+Shishkin, B. K. and Bobrov, E. G. (ed.s) (19652. *Flora of the U.S.S.R.*. Vol XVIII, Metachlamydeae. Izdatel'stvo Akademii Nauk SSSR, Msocow – 1952 –Leningrad.

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).

REFERENCES

Davis, A. P., McGough, H. N., Mathew, B. and Grey-Wilson, C.. (1999). *CITES Bulb Checklist. For the genera:* Cyclamen, Galanthus *and* Sternbergia. The Royal Botanic Gardens, Kew. 87pp.

Davis, P. H. (ed.) (1978) *Flora of Turkey*. Vol. 6. Royal Botanic Garden, Edinburgh.

Grey-Wilson, C. (1988). *The Genus* Cyclamen. The Royal Botanic Gardens, Kew in association with Christopher Helm and Timber Press. 147 pp.

GRIN (2003). The Germplasm Resources Information Network. http://www.ars-grin.gov/cgi-bin/npgs/html/tax_search.pl?cyclamen+coum Downloaded on 18/12/2003

Heywood, V. 1997. *Plant resources and their diversity in the Near East.* In: *Medicinal, Culinary and Aromatic Plants In The Near East* Proceedings of the International Expert Meeting organized by the Forest Products Division, FAO Forestry Department and the FAO Regional Office for the Near East 19 - 21 May 1997 Cairo, Egypt http://www.fao.org/docrep/X5402e/x5402e03.htm

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 *Nardostachys grandiflora* 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.

REFERENCES

Anon. (1997a). *Biodiversity action plan for Bhutan*. National biodiversity strategy and action plan. 188pp. http://www.biodiv.org/doc/world/bt/bt-nbsap-01-en.pdf

Anon. (1997b). *IUCN Analyses of the proposals to amend the CITES Appendices*. Prepared by the IUCN Species Survival Commission and the TRAFFIC Network for the tenth meeting of the Conference of the Parties to CITES. IUCN The World Conservation Union, Gland, Switzerland.

Chauhan, N. S. (1999) *Medicinal and aromatic plants of Himachal Pradesh*. Indus Publishing Company, New Delhi.

Emmett, S. (2003). Mountain medicines. *New Agriculturist On-Line*. http://www.new-agri.co.uk/03-1/focuson/focuson5.html

Hara, H., Stearn, W. T. and Williams, L. H. J. (1978-1982). *An enumeration of the flowering plants of Nepal*. London, British Museum (Natural History). 3 vols.

His Majesty's Government of Nepal, Ministry of Forests and Soil Conservation (2002). *NepalBiodiversity Strategy*. 117pp. http://www.biodiv.org/doc/world/np/np-nbsap-01-en.doc

Jain, S. K. and Rao, R. R. (1983). *An assessment of threatened plants of India*. Proceedings of the seminar held at Dehra Dun, 14-17 Sept., 1981. Howrah, Botanical Survey of India. 334 pp.

Mulliken, T. A. (2000). Implementing CITES for Himalayan medicinal plants *Nardostachys grandiflora* and *Picrorhiza kurrooa*. *TRAFFIC Bulletin* 18 (2): 63-72.

Polunin, O. and Stainton, A. (1984) *Flowers of the Himalaya*. Oxford University Press, Oxford.

Pradhan, R. (1993). Annotations to WCMC plant list for Bhutan dated 31 August 1993.

Shrestha, T. B. and Joshi, R. M. (1996). *Rare, endemic and endangered plants of Nepal*. WWF Nepal Program, Kathmandu.

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

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

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

Taxon	Term	Unit	1995	1996	1997	1998	1999	2000	2001	2002	TOTAL
Schoenorchis gemmata	live					20	36			110	**166**
Sobralia spp.	live					100					**100**
Spathoglottis spp.	live		5		40	4	25				**74**
Staurochilus fasciatus	live			1		3	35	50		10	**99**
Thrixspermum spp.	live		2	4	30	18					**54**
Thrixspermum centipeda	live						30	50			**80**
Thunia alba	live					100					**100**
Thunia alba var. *bracteata*	live							50			**50**
Trias nana	live					100					**100**
Trichoglottis spp.	live		2	4	29	33	1				**69**
Uncifera dalatensis	live					301	640				**941**
Vanda spp.	live		5		526	69	25				**625**
Vanda denisoniana	live				150	1	16	80	50		**297**
Vanda lilacina	live					212		30			**242**
Vanda pumila	live					1		50		250	**301**
Vandopsis 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

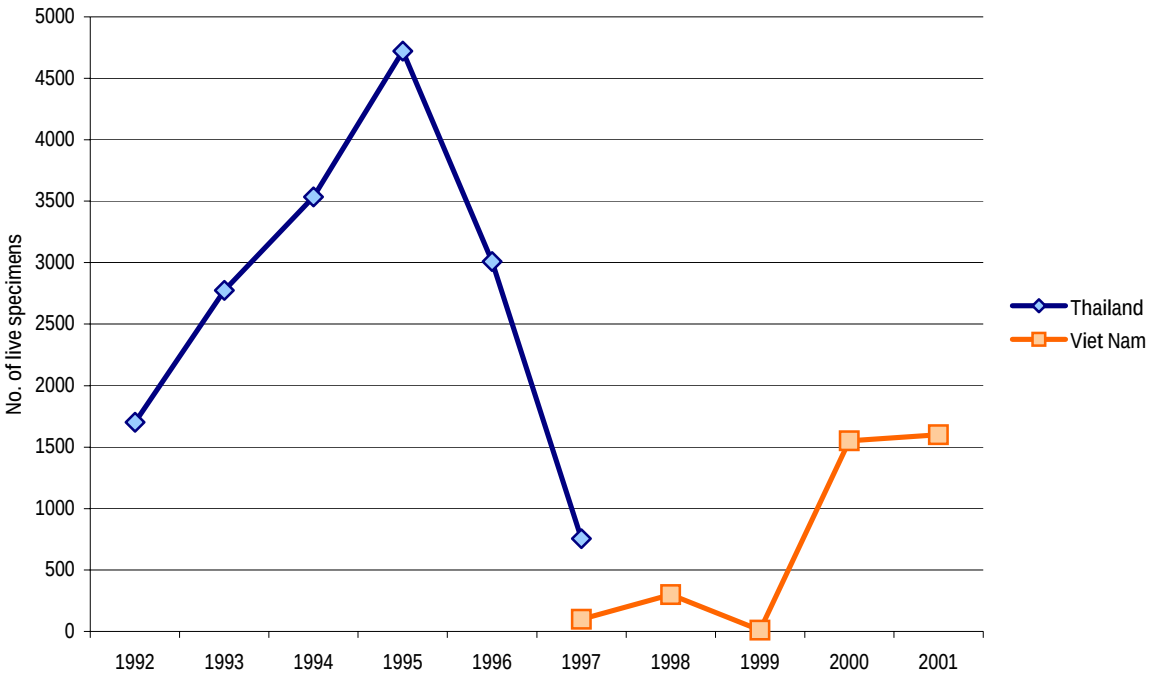


Figure 3: Gross exports of *Dendrobium nobile* from Viet Nam and Thailand

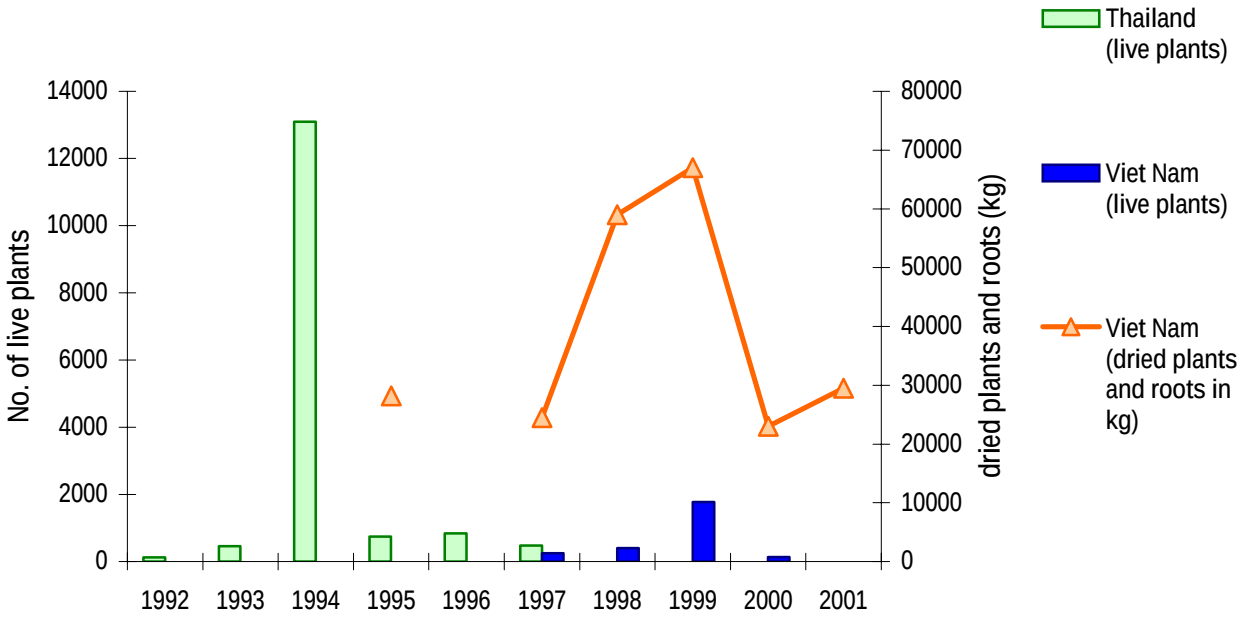


Figure 4: Gross exports of live *Dendrobium secundum* from Viet Nam and Thailand