REPORT

Conservation Assessment and Management Plan Workshop

(C.A.M.P. III)

for Selected Species of Medicinal Plants of Southern India
Bangalore, 16-18 January 1997

Produced by the Participants Edited

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June 1997

Foundation for Revitalisation of Local Health Traditions
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Executive Summary

The Convention on Biological Diversity signed by 150 states in Rio de Janerio in 1992 calls on signatories to identify and components of their state biodiversity and prioritise ecosystems and habitats, species and communities and genomes of social, scientific and economic value.

The new IUCN Red List criteria have been revised by IUCN to reflect the need for greater objectivity and precision when categorising species for conservation action. The CAMP process, developed by the Conservation Breeding Specialist Group, has emerged as an effective, flexible, participatory and scientific methodology for conducting species prioritisation exercises using the IUCN criteria.

Since 1995, the Foundation for Revitalisation of Local Health Traditions has been conducting CAMP Workshops for one of the major groups of conservation concern, medicinal plants. The present workshop is the third in a series which has assessed 139 preselected taxa. These pioneering exercises by FRLHT led to the CAMP process and IUCN Red List Categories being selected by the Endangered Species Subgroup for use in the species prioritisation component of the Biodiversity Conservation Prioritisation Project for India. The first of a series of seven workshops took up selected north, north east, central, and north western medicinal plants for assessment. The combined output of xxx plants assessed in the three workshops of FLRHT and the one workshop under BCPP were noted and used to propose a revised Negative List of Exports, a revised list of species for inclusion on the Wildlife Protection Act and to suggest other conservation measures at the state level.

Therefore, the FRLHT CAMP workshops have - in a very short time - made an extremely significant impact, not only on the conservation of medicinal plants in the southern states which has been to date the mandate of FRLHT, but on the whole country.

The Conservation Action and Management Plan Workshop was developed by CBSG for the purpose of prioritising species for conservation action. Over the last decade, CBSG has conducted dozens of CAMP workshops for literally thousands of species, using (and thereby testing) whatever was the current iteration of the IUCN Red List Categories as the basic methodology to glean a status ranking.

CAMP Workshops bring together a variety of specialists and enthusiast from academic, government, managerial, and even the commerical sector to evaluate taxa for setting priorities for conservation action. The fear of loss and hope of recovery of species drives CAMP Workshops. Individuals part with unpublished information in order to contribute to a body of information which will provide strategic guidance for application of intensive management and information gathering. CAMP Workshops results, are, or should be, dynamic, leading to specific conservation activities in forest, market, classroom, courtroom — locally and nationally as well as on the international stage.

Medicinal plants are receiving an enormous amount of attention today. The resurgence of interest in natural systems of medicine, in indigenous peoples and practices, the increasing use of parts or extracts or compounds made from medicinal plants, the realisation of the potential loss through both domestic and foreign trade, and the publicity engenered by the

Convention on Biodiversity and Gatt treaty have combined to form what is practically a "movement" for medicinal plants.

FRLHT is a non-governmental organisation which was launched to preserve and promote India's traditional medical legacy. Its primary objective is to enhance understanding and awareness of the need for conservation and stress the importance of medicinal plants in primary health care. FRLHT utilises the output of the CAMP Workshop to carry out its objectives of conservation, research and education. Some of the ways CAMP species have been used are: assembling a data base (including line drawings, photos, information, maps; initiating a Genome Resource Banking programme; producing and distributing thousands of attractive posters and handouts; setting up conservation parks and demonstration gardens.

A Conservation Action and Management Plan (C.A.M.P.) Workshop for selected species of Medicinal Plants of southern India was held in Bangalore, India from 16-18 January 1997, organised by the Foundation for Revitalisation of Local Health Traditions (F.R.L.H.T.). This Workshop was the third in a series of workshops on selected species of rare southern Indian medicinal plants conducted in 1995,1996, and 1997. Southern Indian Medicinal Plants CAMP, 1995 was a landmark exercise in that it was the first time a Conservation Action and Management Plan workshop had been carried out exclusively for plants and also on a country-regional basis. The two follow-up workshops, Southern Indian Medicinal Plants CAMPs (1996 and 1997) to assess additional species, many of them recommended by participants of previous workshops, was also an innovative use of the CAMP process.

The goals of the CAMP Workshop were:
1. To use populations, habitat and threat parametres to assess the conservation status and assign an IUCN Red List ranking to 64 species of southern Indian Medicinal Plants selected by workshop participants of CAMP 1996 and FRLHT,

2. To provide information about the species which would be useful in drawing up Action Plans and Management Plans, including recommendations for *in situ* and *ex situ* management; research, survey and monitoring; cultivation; investigation of limiting factors; taxonomic and other specific research; education and activism.

3. To produce a Conservation Assessment and Management Plan Report for the 64 species, which after review and comment by workshop participants, would be distributed to all parties interested in medicinal plants conservation.

Thirty-six species of medicinal plants were assessed in CAMP I in 1995,44 in CAMP II in 1996 and 64 in CAMP III, 1997 using the revised IUCN categories of threat. The 64 plants were divided into four groups of 16 each and each participant was assigned to one of four Working Groups. These were then passed around to all the other groups for additions and corrections. Plenary sessions to review the assessments and discuss controversial points were held from time to time. Results of this carefully guided group process were:

Of the 64 species considered, 35 are endemic to the region, 29 are non-endemic native species extending throughout India or to Southeast Asia or Africa. The endemics were

categorised under the threat categories as Critically endangered (5); Endangered (9); and Vulnerable (15) and under non-threat categories as LR-nt (2) and DD (2). The non-endemic native species were all classified according to the IUCN categories at the regional level. (EN = 10; VU = 14; LRnt = 1; LRlc = 7; DD = 3). All of the 29 non-endemic species were categorised as Data Deficient at the Global level.

Suggestions for changes in the format for Data Quality, Threats, Research recommendations and Cultivation recommendations resulting from FRLHT CAMP workshops have been incorporated into the Taxon Data Sheets in India and for the rest of the world as well.

The Draft Report was circulated to all participants and returned with corrections by nearly 50% of participants. Editorial and other corrections which did not diverge widely from the group concensus were incorporated into the Report. This Report is being circulated to participants as well as policy makers, research institutions, non-governmental organisations and field managers in southern India and the nation's capital to use in establishing conservation programmes and protection measures for rare species of medicinal plants.

Now, there is a plan to reassess the plants covered in the last three CAMPs and bring out a Red Data Book for Medicinal Plants of Southern India. This will be another innovation on the CAMP process by the Foundation for Revitalisation of Local Health Traditions.

List of taxa assessed in the Southern Indian Medicinal Plants Conservation Assessment and Management Plan Workshop -- "C.A.M.P. III" in a series, 1997*

Family	Taxa
Anacardiaceae	*Semecarpus travanconca* Beddome
Anonaceae	*Uvaria hookeri* King
	= *U. narum* Wallich ex Hook.f. & Thoms, var. *macrophylla* Hook.f.
Thorns.	
Apiaceae	*Heracleum candolleamim* (Wight & Aim.) Gamble
Apiaceae	*Heracleum rigens* Wallich ex DC.
Apocyanaceae	*Chonemorpha fragrans* (Moon) Alston.
	= *C. macrophylla* G.Don
Araceae	*Amorphophallus commutatus* (Schott) Engl.
	= *Conophallus commutatus* Schott
Araceae	*Raphidophora pertusa* (Roxb.) Schott
	= *Pathos pertusa* Roxb.
	= *Monster a pertusa* (Roxb.)
	= *Seindapsus pertusa* (Roxb.) Schott
Asclepiadaceae	*Gymnema khandalense* Santapau
Asclepiadaceae	*Gymnemamontanum* (Roxb.) Hook.f. var. *montanum*
Burseraceae	*Canarium strictum* Roxb.
Caesalpiniaceae	*Humboldtia vahliana* Wight
Capparaceae	*Cleome burmanni* Wight & Arn.
Celastraceae	*Celastrus paniculatus* Willd. ssp. *paniculatus*
Combretaceae	*Terminalia arjuna* (Roxb. ex DC.) Wight & Arn.
Clusiaceae	*Calophyllum apetalum* Willd.
	= *C. decipiens* Wight
	= *C. wightianum* Wallich ex Planchon & Triana
Clusiaceae	*Garcinia gummi-gutta* (L.) Robson
	= *G. cambogia* (Gaertn.) Desr.
Clusiaceae	*Garcinia rubro-echinata* Kosterm.
	= *G. echinocarpa* Gamble
Clusiaceae	*Garcinia talbotir* Raizada ex Santapau
	= *G. ovalifolius* (Roxb.) Hook.f. var. *macrantha* Hook.f.
	= *G malabarica* Talbot
Clusiaceae	*Garcinia travancorica* Beddome
Cucurbitaceae	*Luffa umbellata* Klein ex Willd. Roemer
Cucurbitaceae	*Trichosanthes anamalayana* Beddome
Cucurbitaceae	*Trichosanthes cucumerina* L.
Dipterocarpaceae	*Dipterocarpus indicus* Beddome
Dipterocarpaceae	*Shorea tumbuggaia* Roxb.
Ebenaceae	*Diospyros candolleana* Wight
Ebenaceae	*Diospyros pamculata* Dalz.
Elaeocarpaceae	*Elaeocarpus serratus* L.
Euphorbiaceae	*Baliospermum montanum* (Willd.) Muell.-Arg.
	= *B. axillare* Blume
	= *B. polyandrum* Wight
	= *Jatropha montana* Willd.
Fabaceae	*Dalbergia horrida* (Dennst.) Mobb.
	= *D. sympathetica* Nimmo
Flacourtiaceae	*Hydnocarpus alpina* Wight
Flacourtiaceae	*Hydnocarpus pentandra* (Buch.-Ham.) Oken
	= *H. laurifolia* (Dennst.)
Gentianaceae	*Swertia corymbosa* (Griseb.) Wight ex B.Clarke
Gentianaceae	*Swertia lawii*(Wight ex B.Clarke) Burkill

Hippocrateaceae	*Salacia oblonga* Wallich ex Wight & Am.
Hippocrateaceae	*Saiacia reticulata* Wight
Lamiaceae	*Plectranthus nilgherricus* Benth.
Lauraceae	*Cinnamomum malabatrum* (Burm.f.) Blume.
	= *C. macrocarpum* Hook.f.
Lauraceae	*Cinnamomum sulphuratum* Nees.
Lauraceae	*Cinnamomum wightii* Meissner
Lauraceae	*Persea macrantha* (Nees) Kosterm.
	= *Machilus macrantha* Nees
Liliaceae	*Smilax zeylanica* L.
	= S. *macrophylla* Wight
Logainaceae	*Strychnos aenea* A.W. Hill
	= *S. rheedii* Brandis
Magnoliaceae	*Michelia nilagirica* Zenk.
Meliaceae	*Aphanamixispolystachya* (Wallich) Parker
	= *Aglaiapolystachya* Wallich
	= *Amoora rohituka* (Roxb.) Wight & Am.
	= *Andersonia rohituka* Roxb.
Meliaceae	*Dysoxylum malabaricum* Beddome ex Hiern
Moraceae	*Artocarpus hirsutus* Lam.
Myristicaceae	*Knema attenuata* (Wallich ex Hook.f. & Thomson) Warb.
	= *Myristica attenuata* Wallich ex Hook.f. & Thomson
Myristicaceae	*Myristica dactyloides* Gaertner
	= *M. beddomei* King
	= *M. contort a* Warb.
Myrsinaceae	*Embelia tsjeriam-cottam* (Roemer & Schutes) DC.
	= *E. robusta* auct. non Roxb.
Ophioglossaceae	*Helminthostachys zeylanicus* (L.) Hook.
	= *H. dulcis* Kaulf.
Orchidaceae	*Dendrobium ovatum* (Willd.) Kranzl.
Orchidaceae	*Eulophia cullenii* (Wight) Blume
Orchidaceae	*Eulophiaramentacea* Lindl. ex Wight
	= *E. pratensis* Lindl.
Periplocaceae	*Decalepis hamiltonii* Wight & Am.
Santalaceae	*Santalum album* L.
Sapindaceae	*Sapindus laurifolia* Vahl
	S. trifoliatus sensu Hiern. non L.
Sapotaceae	*Madhuca longifolia* var. *longifolia* (Koering) Macbr.
	= *Bassia longifolia* Koering
Sapotaceae	*Madhuca nerifolia* (Moon) H.J. Lam.
	= *Bassia malabarica* Beddome
Sterculiaceae	*Pterospermum xylocarpum* (Gaertner) Santapau & Wagh
	= *P. heyneanum* Wallich ex Wight & Am.
Valerianaceae	*Valeriana leschenaultii* DC.
Verbenaceae	*Vitex trifolia* L.
Zingiberaceae	*Alpinia galanga* Sw.
	= *A. rheedii* Wight
Zingiberaceae	*Curcuma pseudomontana* Graham
	= *C. ranadei* Prain
	= *C. montana* sensu Baker
Zingiberaceae	*Curcuma zedoaria* (Christm.) Roscoe
	= *C. zerumbet* Roxb.

* arranged alphabetically according to family

Summary Data Table
Medicinal Plants of Southern India
16-18 January 1997, Bangalore

CAMP III Results

Summary Data Table for selected species of Medicinal plants of southern India (CAMP III)

Species	Habit	Habitat	Rnge	Area	No. of Loc.	% Dec.	Yr. / Gen.	Pop. No.	Data Qlty.	Thrt.	IUCN	Crit. Used	Res. Rec.	Cult. Rec.	Level Diff.
Anacardiaceae															
Semecarpus travancorica	Tree	EF	C	C	NK	20%	3 gen.	NK	2	L	VU	PR, EO	M, P	P	NK
Anonaceae															
Uvaria hookeri	Shrub	EF	D	NK	NK	NK	NK	NK	2	NK	DD	N/A	S, M	No	NK
Apiaceae															
Heracleum candolleanum	Perennial herb	Montane Shola grassland	C	C	Many F	20%	10 yr.	NK	2	Hm, L, T	VU	PR, EO	M, Hm	No	3
Heracleum rigeiis	Herb	Bare slopes	C	C	Many	NK	NK	NK	2	Tp	VU-R	EO	S, M	No	NK
Apocyanaceae															
Chonemorpha fragrans	Large woody climber	MDF to EF	D	C	Many	> 50%	10 yr.	NK	1,2	L, Hm	EN-R	PR	S, M, Hm, Lh	3	NK
Araceae															
Amorphophallus commutatus	Cormus herb	MDF to SEF in open, forest fringes	D	D	Many	20%	10 yr.	NK	2,3	L, Hf, Hm, P, Lf	VU	PR	S, M, Hm, Lh	No	1
Raphidophora pertusa	Epiphytic climber	DDF, SEF to EF	C	D	Many	25%	10 yr.	NK	2	L,Tp	VU-R	PR	Hm	No	1
Asclepiadaceae															
Gymnema khandalense	Woody climber	MDF	C	B	4, F	NK	NK	NK	2	Hm, T	EN	EO	S, M	P	NK

Species	Habit	Habitat	Rnge	Area	No. of Loc.	% Dec.	Yr. / Gen.	Pop. No.	Data Qlty.	Thrt.	IUCN	Crit. Used	Res Rec.	Cult. Rec.	Level Diff.
Gymnema montanum var. *montanum*	Climber	SEF to EF	B	B	4, F	NK	NK	NK	2,4	Ov, Tp, Hm	EN	EO	S, M	P	NK
Burseraceae															
Canarium striatum	Tree	TDE to EF	D	C	Many F	> 20%	10 yr.	NK	2	L, I, T, Hm, Ov	VU-R	PR, EO	G	2	3
Caesalpiniaceae															
Humboldtia vahliana	Tree	EF along river banks/ beds	C	C	Many F	20%	3 gen.	NK	2	Hm, Tp	EN	EO	M	No	NK
Capparaceae															
Cleome burmanni	Herb	NK	NK	NK	NK	NK	NK	NK		NK	DD-R	N/A	S	No	NK
Celastraceae															
Celastrus paniculatus ssp. *paniculatus*	Climbing shrub	DDF, MDF to SEF	D	D	Many	20%	10 yr.	NK	2	L, Hm, Tp	VU-R	PR	Hm, O	1	NK
Combretaceae															
Terminalia arjuna	Tree	MDF to SEF	D	D	NK	<20%	3 gen.	NK	2	Ht, Tp Hm	LRnt - R	N/A	M	1	1
Clusiaceae															
Calophyllum apetalum	Tree	SEF and EF along river and stream bank	C	C	Many F	> 20%	3 gen.	NK	2,4	L, Ht, Hm, T	VU	PR, EO	G, M Hm,	1	NK

Species	Habit	Habitat	Rnge	Area	No. of Loc.	%Dec.	Yr. / Gen.	Pop. No.	Data Qlty.	Thrt.	IUCN	Crit. Used	Res. Rec	Cult. Rec.	Level Diff.
Garcinia gummi-gutta	Tree	SEF to EF	D	D	Many	None	N/A	NK	2	L, Hf, Hm, T	Lrnt	N/A	S, M, Hm	1	1
Garcinia rubro-echinata	Tree	EF	B	B	F	NK	NK	NK	2	Lf, Tp	EN	EO	S, M	P	NK
Gracinia talbotir	Tree	SEF to EF	C	C	Many	NK	NK	NK		L, Hf, T	VU	EO	S, M	No	NK
Garcinia travancohca	Tree	ESF	A	A	5	50%	3 gen.	<250	1,2	I, Hm, T	EN	PR, EO. PE, NM	M, G	1	NK
Cucurbitaceae															
Luffa umbellata	Climber	Edges of EF along foothills	B	B	Few	NK	NK	NK	2	NK	DD	N/A	S, T	No	NK
Trichosanthes anamalaiensis	Climber	SEF to SF	A	A	2, F	50%	10 yr	NK	1,2	I, Hm, T	CR	EO	S,M, P	1	NK
Trichosanthes cucumerina var. *cucumerina*	Climber	Coast to DF	D	D	Many F	NK	NK	NK	2	NK	DD-R	N/A	M	No	NK
Dipterocarpaceae															
Dipterocarpus indicus	Large tree	SEF to EF	D	D	Many	>50%	3 gen.	NK	2	L, Ht, T	EN	PR	S, M, Hm, Lh	1	NK
Shorea tumbuggaia	Medium tree	DDF	B	A	Very few, F	> 80%	3 gen.	NK	2,4	L, Lf, Hm	CR	PR, EO	S,M, Hm, Lh,0	1,2	NK
Ebenaceae															
Diospyros candolleana	Tree	MDF to EF	D	C	NK	>20%	3 gen	NK	2	L, Hm, T	VU	PR	M	No	NK

Species	Habit	Habitat	Rnge	Area	No. of Loc.	% Dec.	Yr. / Gen.	Pop. No.	Data Qlty.	Thrt.	IUCN	Crit. Used	Res. Rec.	Cult. Rec,	Level Diff.
Diospyros paniculata	Tree	Moist SEF	D	D	9, F	30%	3 gen	NK	2	Lf, Lp.T, Hm	VU	PR	S, Hm M, Lh	No	NK
Elaeocarpaceae															
Elaeocarpus serratus	Small to medium tree	MDF to SEF	D	D	Many	<10%	2 gen.	NK	2	NK	LRnt - R	N/A	None	No	NK
Euphorbiaceae															
Baliospermum montanum	Under shrub	SEF at low elevations	D	B	Many F	20-30%	10 yr.	NK	2	Lf, Ov Hm, T	EN-R	EO	M, Hm	1	NK
Fabaceae															
Dalbergia horrida	Climbing shrub	MDF	D	D	NK	>20%	3 gen.	NK	2	L, Hm	VU	PR	M,T	P	NK
Flacourtiaceae															
Hydnocarpus alpina	Tall tree	EF along stream banks, moist valleys	D	C	Many F	>50%	3 gen.	NK	2	L, Ov, Hm, Lf, Tp	EN-R	PR	S, M, Hm, Lh, Lr, PP	1	2
Hydnocarpus pentandra	Tree	MDF to SEF	D	D	NK	> 20%	3 gen.	NK	2	Lf, Ov, P Hm, T	VU	PR	M, Lh, P	1	1
Gentianaceae															
Swertia corymbosa	Herb	Grassland	C	C	Many F	>20%	10 yr.	NK	2	L, Lf, Hm, P,T	VU	PR, EO	M, Lh,P P	3	NK
Swertia lawii	Herb	Grassland	B	B	Few, F	>20%	10 yr.	NK	4	L, Lp, P	EN	EO	S, M, Lh, PP	3	NK

Species	Habit	Habitat	Rnge	Area	No. of Loc.	% Dec.	Yr. / Gen.	Pop. No.	Data Qlty.	Thrt.	IUCN	Crit. Used	Res. Rec.	Cult. Rec.	Level Diff.
Hippocrateaceae															
Salacia oblonga	Climbing shrub	MDF to EF	C	B	<5, F	20%	10 yr.	NK	2,3	L, Hm	EN	EO	S, Lh, Hm, M, PP	3	3
Salacia reticulata	Scandent shrub	SEF, coastal	B	C	Many	50%	10 yr.	NK	2	L,Tp, Hm	EN	PR	S, Lh, M, PP	3	1
Lamiaceae															
Plectranthus nilgherrius	Tall herb/ under shrub	EF	B	B	Few, F	>20%	10 yr.	NK	2	L, Lf	EN	EO	S, Lh, Lm	No	NK
Lauraceae															
Cinnamomum malabatrum	Tree	MDF to EF	D	D	NK	>30%	3 gen	NK	1,2	Hm, Tp	VU	PR	S, Lr, O	1	2
Cinnamomum sulphuratum	Tree	MDF to EF	D	C	NK	>20%	3 gen.	NK	2	L,Tp, Hm	VU	PR	S, Lr, O	1	2
Cinnamomum wightii	Tree	SF	B	B	Few, F	>20%	3 gen.	NK	2	Lf, T, Hm	EN-R	EO	S, M, T	1	3
Persea macrantha	Large tree	SEF to EF	D	D	Many	>20%	3 gen.	NK .	2	Ht, T, Hm	VU -R	PR	Hm, Lh	1	NK
Liliaceae															
Smilax zeylanica	Climbing shrub	Scrub, DDF to EF	D	D	Many	20%	10 yr.	NK	2	L,Tp, Hm	Lrnt R	N/A	M, Lh, Hm, PP	3	NK
Logainaceae															
Strychnos aenea	Climbing shrub	EF	B	B	5	>50%	3 gen	NK	2,4	L, Ov, Hm	EN	PR, EO	S, Lh, M, PP Hm	No	NK

Species	Habit	Habitat	Rnge	Area	No. of Loc.	%Dec.	Yr. / Gen.	Pop. No.	Data Qlty.	Thrt.	IUCN	Crit. Used	Res. Rec.	Cult. Rec	Level Diff.
Magnoliaceae															
Michelia nilagirica	Tree	EF to SF	D	D	NK	>20%	3 gen.	NK	2	L	VU R	PR	M, Hm	1	2
Meliaceae															
Aphanamixis polystachya	Tree	MDF, SEF toEF	D	C	Many	>20%	10 yr	NK	2,3	L,Tp, Hm	VU-R	PR	S, Lh, M, PP Hm	No	NK
Dysoxylum malabaricum	Large tree	EF	D	D	Many	> 50%	3 gen	NK	2	L, Ov Lf, Lp, Ht, T, Hm	EN	PR	S, Lh, Hm, M, PP	1	2
Moraceae															
Artocarpus hirsutus	Tree	MEF to SEF	D	D	NK	>20%	3 gen.	NK	2	T, Ht, T	VU	PR	S,T	No	1
Myristicaceae															
Knema attenuata	Medium tree	SEF and EF	D	D	Many	<20%	2 gen.	NK	2, 3	L, T,H	LRnt	N/A	Hm	No	NK
Myristica dactyloides	Tree	EF	D	D	NK	>20%	3 gen.	NK	2	Hm, Ov, T	VU-R	PR	M, O, P	P	NK
Myrsinaceae															
Embellia tsjeriam-cottam	Shrub	DDF, MDF and SEF	D	B	Few, F	20%	10 yr.	NK	2,4	Lf, Ls, Hm, T	EN-R	EO	M,T	No	3
Ophioglossaceae															
Helminthostachys zeylanicus	Herb	Swamps, Marshes, cool forest floors	B	B	Many F	20%	10 yr.	NK	2	Hf, Tp Hm, I	EN -R	EO	S, M	1	NK

Species	Habit	Habitat	Rnge	Area	No. of Loc.	% Dec.	Yr. / Gen.	Pop. No.	Data Qlty.	Thrt.	IUCN	Crit. Used	Res. Rec.	Cult. Rec.	Level Diff.
Orchidaceae															
Dendrobium ovatum	Epiphytic herb	Open grassland in MDF to SEF	D	D	Many	20%	10 yr.	NK	2	L, Lf, I	VU	PR	M	No	NK
Eulophia cullenii	Herb	Grasslands	A	A	5, F	50%	10 yr.	NK	2	L, I, P, Hm, T	CR	EO	S, M, P	No	1
Eulophia ramentacea	Herb	Grasslands	C	A	Few, F	50%	10 yr.	NK	2,4	L, I	CR	EO	M, G	No	NK
Periplocaceae															
Decalepis hamiltonii	Climber	DDF to MDF	C	B	Few, F	20%	10 yr.	NK	2	L, Ov, P, Tp, Hm	EN	EO	G,0	1	NK
Santalaceae															
Santalum album	Tree	DDF, MDF	D	D	Many	>50%	3 gen.	NK	2	LP, D, Ov, Ht, T, Hm	EN-R	PR	Hm	1	3
Sapindaceae															
Sapindus laurifolia	Tree	DF to SEF	D	D	Many	NK	NK	NK	2	Tp	LRnt - R	N/A	M	1	1
Sapotaceae															
Madhuca longifolia var. *longifolia*	Large tree	DF to MF	D	D	Many	>50%	3 gen.	NK	2,3	L, Ht, Ov, T Hm, P	EN-R	PR	Hm, Lh	1	1
Madhuca neriifolia	Tree	SEF, EF along water courses	D	D	Many	20%	10 yr.	NK	3	L, Hm, T	VU-R	PR	S, Hm M, PP	No	NK

Species	Habit	Habitat	Rnge	Area	No of Loc.	% Dec.	Yr. / Gen.	Pop. No.	Data Qlty.	Thrt.	iUCN	Crit Used	Res. Rec.	Cult. Rec.	Level Diff.
Sterculiaceae															
Pterospermum xylocarpum	Tree	Mixed DF, MDF, SEF	D	D	Many	>10%	2 gen.	NK	2	L, H, Tp	LRnt - R	N/A	Hm, Lh	No	NK
Valerianaceae															
Valeriana leschenaultii	Large herb	Shola, EF margins	C	B	3, F	80%	10 yr.	NK	2	L	CR	PR	S, Hm M, Lh, PP	1	NK
Verbenaceae															
Vitex trifolia	Shrub/ small tree	Coast	D	D	Many	None	N/A	NK	2	Hm, Tp	LRnt - R	N/A	None	No	NK
Zingiberaceae															
Alpinia galanga	Perennial herb	EF along streams, DF	NK	NK	NK	NK	NK	NK	4	T	DD-R	N/A	S	No	1
Curcuma pseudomontana	Herb	MDF to SEF along water courses	D	C	NK	>30%	10 yr.	NK	2	Hm, Tp, Ov	VU	PR	Hm, P	1	1
Curcuma zedoana	Herb	MDF	D	D	Few	NK	NK	NK	2	Hm, Tp	LRnt-R	N/A	S, T, Lr, P	No	NK

Habitat: DDF = Dry Deciduous Forest; MDF = Moist DeciduousForest; Mixed DF = Mixed Deciduous Forest; DF = Deciduous Forest; SEF = Semi Evergreen Forest, EF = Evergreen Forest; NK = Not Known; F = Fragmented
Range: **A** = < 100 sq km ; B = < 5,000 sq. km.; C = < 20,000 sq. km.; D = > 20,000 sq km.
Area: A = <10sq km, B = < 500 sq. km.; C = <2,000 sq. km.; D = > 2,000 sq. km.
Data Quality: 1 = Reliable census or population monitoring; 2 = General field study; 3 = Informal field sighting; 4 = Indirect information
Threat: L = Loss of habitat; Lf = Los of habitat due to fragmentation; D = Disease; H = Harvest; Hf = Harvest for food; Hm = Harvest for medicine; Ht = Harvest for timber; I = Human interference, L = Loss of habitat; Lf = Loss of habitat due to fragmentation, Lp = Loss of habitat due to exotic plants; Ls = Landslide; Ov = Over exploitation; P = Predation; Sf = Fire as catastrophic event; T = Trade; Tp = Trade of parts
Research Recommendations: G = Genetic management; H = Husbandry research; Hm = Habitat management; Lh = Life history studies; Lm = Limiting factor management; Lr = Limiting factor research; M = Monitoring; O = Other (specific to the species); P = PHVA; PP = PHVA pending further work; S = Survey -search and find; T = Taxonomic and mophological genetic studies; Tl = Translocations
Cultivation Recommendations: 1 = Cultivation for conservation either only in situ or both in situ and ex situ with the population maintaining 90% genetic diversity for 100 years, 2 = same as 1 but with periodic reinforcement of cultivations with genetic material from the wild; 3 = Cultivation only for research, education or husbandry but not for conservation; P = Pending
Level of **difficulty:** 1 = Least difficult; 2 = Moderately difficult; 3 = Very difficult

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Activities of FRLHT using CAMP I (1995) and II (1996)
Species of Medicinal Plants

*** Database for CAMP species** :

FRLHT has collected photographs, negatives, and slides of type specimens as well as references in the Library at Kew Gardens. They have also listed and begun collecting similar material from the Oriental and India Office Library, London. Some of this material is available only in these institutions and will make a useful addition to the national botanical reference respository.

* **Maps:**

Work has been completed on 40 eco-distribution maps of CAMP species assessed as threatened.

* **Genome Resource Banking** :

A Memorandum of Understanding with the National Bureau of Plant Genetic Resources, New Delhi is under consideration for longterm storage of seeds of CAMP targeted threatened species.

* **Education**:

An attractive Red List poster has been designed and printed in four languages. This poster has been distributed or sold in 1996. Stickers of four threatened species from CAMP assessments have been produced. Several thousand of these educational items have been distributed.

* ***Ex situ*** **conservation** :

Live specimens of 28 CAMP species have been collected and are gowing in demonstration gardens of 11 ex *situ* Medicinal Plants Conservation Parks.

Commitments

Suggestions of species for next CAMP Workshop and Participant Specialists volunteering to work on them

Data Deficient Species from CAMP III, 1997	Specialist committed to survey DD species
1. *Alpinia galanga*	Dr. S.Armagum
2. *Cleome burmanni*	Dr. V. S. Ramachandra
3. *Luffa ambellata*	Dr.S.Armagum
4. *Curcuma zedoria*	Dr. V. S. Ramachandra
5. *Smilax wrightii*	Dr. A.G. Pandurangan
6. *Trichosanthes cucumerina*	Dr. K. Ravi Kumar
7. *Uvaria hookerii*	Dr. A.G. Pandurangan
8. *Garciniarubro chiinata*	--
9. *G. talbotii*	Dr. K. Ravi Kumar
10. *Herableum regens*	Dr. M. B. Vishwanath

New species suggested:

Luffa acutangula (suggested by Shahnaz Khan)	Mr. A.E. ShanawazKhan

What is a CAMP Workshop ?
Conservation Assessment and Management Plan (CAMP)

The Conservation Assessment and Management Plan (or CAMP) Workshop is a process which has been developed specifically to respond to the need for basic information which reflects a consensus by specialists and other stakeholders in the range states.

CAMPs are intended to provide strategic guidance for application of intensive management and information collection techniques to threatened taxa. CAMPs provide a rational and comprehensive means of assessing priorities for intensive management within the context of the broader conservation needs of threatened taxa.

CAMP Workshops were developed by the Conservation Breeding Specialist Group (CBSG) whose primary role in SSC, IUCN is to contribute to the development of holistic (i.e., integrating *in situ* and ex situ) and viable conservation strategies and action plans.

The CAMP process assembles a broad spectrum of expertise on wild and captive management of the *taxa* under review, bringing together 10-40 experts (e.g., wildlife managers, researchers, scientists, NGOs and individual specialists to evaluate the threat status of all taxa in a broad group (e.g., an order or family), country, or geographic region to set conservation action and information-gathering priorities using the new IUCN Red List Criteria.

The New IUCN Red List Categories
The threatened species categories now used in Red Data Books and Red Lists had been in place, with some modification, for almost 30 years. The Mace-Lande criteria (1991) were one developmental step in an attempt to make those categories more explicit, and were tested extensively in early CAMPs. These criteria subsequently have been revised and formulated into the New IUCN Red List Categories which were approved by IUCN in 1994.

The New IUCN Red List Categories provide a system that facilitates comparisons across widely different taxa, and is based both on population and distribution criteria. These criteria can be applied to any taxonomic unit at or below the species level, with sufficient range among the different criteria to enable the appropriate listing of taxa from the complete spectrum of taxa, with the exception of micro-organisms (Mace et al., 1994).

The New IUCN Red List Categories are: Extinct (EX); Extinct in the Wild (EW); Critically Endangered (CR); Endangered (EN); Vulnerable (VU); Conservation Dependent (CD); Lower Risk (LR); Data Deficient DD); Not Evaluated (NE).

The CAMP Process
The CAMP process itself is intensive and interactive. It is unique in its ability to facilitate objective and systematic prioritization of research and management actions needed for species conservation. Participants develop the assessments of risks and formulate recommendations for action using a Taxon Data Sheet that allows recording of detailed information about each taxon under review, including data on the status of populations and habitat in the wild as well as recommendations for intensive conservation action. The Taxon Data Sheet is augmented by a spreadsheet that summarizes data written on the Taxon Data Sheet and provides for rapid review or comparison of taxa. Now a computer programme has been designed for entering CAMP data and aiding analysis.

During a CAMP process, the wild (and captive, if applicable) status for each taxon under consideration are reviewed, on a taxon-by taxon basis (usually at the subspecies level). For each taxon, there is an attempt to estimate the total population. *It is very difficult, even agonizing, to be numerate because so little quantitative data on population sizes and distribution exists.* However, it is frequently possible to provide order-of-magnitude estimates, especially whether the total population is greater or less than the numerical thresholds for the population data used in determining categories of threat. *CAMP spreadsheets include a "data quality" column so that "guesstimates" can be distinguished from population estimates based on solid documentation.*

The CAMP process attempts to be as quantitative or numerate as possible for two major reasons:
1) Action plans ultimately must establish numerical objectives for population sizes and distribution if they are to be viable.
2) Numbers provide for more objectivity, less,ambiguity, more comparability, better communication and hence cooperation.

Information about population fragmentation and trends, distribution, as well as habitat changes and environmental stochasticity also are considered. For each taxon reviewed, two major activities are carried out:

1) assigning taxa to New IUCN Red List Category of Threat;

2) making recommendations for research and management activities which contribute to the taxon's conservation.

CAMP recommendations aim to more fully integrate recommended research and management actions and known threats. Research management can be defined as an interactive management program including a strong feedback loop between management activities, evaluation of their effectiveness, and the response of the species. Management recommendations may include captive programs if they can contribute to the conservation of the taxon.

Review Process for CAMPs

The results of the Initial CAMP process are reviewed: 1) by distribution of a preliminary draft to the workshop participants; 2) by distribution to a broader audience which includes CAMP participants, wildlife managers and policy makers; 3) by periodic distribution of Summaries to key persons such as managers in transferrable posts. Thus CAMPs are not single events but part of a continuing and evolving process of developing conservation and recovery plans for the taxa involved. CAMP Reports are "living" documents that can be continually reassessed and revised as new information becomes available and as the national or regional situation changes for better or worse.

In order to insure that a maximum amount of productive interaction takes place with a minimum of wasted energy, Ground Rules - based on principles of group dynamics - There are made explicit at the beginning of a CAMP process and a "contract" between all participants made. The Groundrules are :

- Every idea or plan or belief about the Taxon or Region can be examined and discussed.
- Everyone participates in discussions and no one dominates.
- Everyone will set aside all special agendas except conserving the Taxon under assessment
- Everyone assumes good intent of other participants and treats them with respect.
- Everyone agrees to stick to the schedule ... to begin and end promptly.
- Primary work is conducted in sub-groups with periodic plenaries for review
- Facilitators of plenary sessions or working groups can call 'time out' if discussion reaches an impasse, strays too far off the topic at hand or degenerates into unproductive interaction.
- Agreements or recommendations are reached by consensus
- Group goal is complete and review a draft report by the end of the meeting.
- Flexibility is important... to adjust process and schedule as needed to achieve goals.

As you all know...

Reduction and fragmentation of wildlife populations and habitats are occurring at a rapid and accelerating rate. The results for an increasing number of taxa are small and isolated populations that are at risk of extinction. For such populations, more intensive management is necessary for their survival and recovery. To an ever increasing extent, this intensive management will include habitat management and restoration, intensified information gathering, captive breeding and other strategies. The problems for wildlife are so enormous that it is vital to apply the limited resources available for intensive management as efficiently and effectively as possible. The CAMP process provides a means of doing just that.

CBSG, India

The CAMP Workshop Process was developed by the Conservation Breeding Specialist Group of SSC, IUCN. CBSG conducts CAMP Workshops all over the world and also Training in Facilitation and organisation of same. CBSG, India is a recognised Regional Network of CBSG whose main office is in Minnesota. CBSG, India conducts CAMP and PHVA workshops in India using tools and techniques developed by CBSG but suitably modified for regional conditions. For a summary of two previous CAMP Reports (on medicinal plants) which contain more detailed information about CBSG, India, PHVA Workshops conducted in India and the CAMP process, write to ZOO/CBSG, India, Box 1683, Peelamedu, Coimbatore 4.

CBSG

CBSG is a Specialist Group of the Species Survival Commission of IUCN

CBSG, India

CBSG, India is the Indian Regional Network of CBSG, SSC, IUCN

VERSION -96

FRLHT's PRIORITY LIST OF MEDICINAL PLANTS OF SOUTH INDIA

Sl.No.	Botanical Name	Family	Sanskrit Name	Habit	Parts Used
1.	*Abrus precatorius* L.	Fabaceae	Gunjaa	aimber(W)	Roots
2.	*Abutilon hirtum* G. Don	Malvaceae	Atibala	Herb	Roots
3.	*Abutilon indicum* (L.) Sw.	Malvaceae	Atibalaa	Herb	Roots
4.	*Acacia nilotica* (L.) Willd. ex Del.	Mimosaceae	Babbula	Tree	Bark
5.	*Acacia catechu* (Roxb.) Willd.	Mimosaceae	Khadira	Tree	Stem
6.	*Acacia chundra* Willd.	Mimosaceae	Khadira	Tree	Stem
7.	*Acacia concinna* (Willd.) DC.	Mimosaceae	Saptalaa	Liana	Fruits
8.	*Achyranthes aspera* var.rubro-fusca Hook. f.	Amaranthaceae	Apaamarga	Herb	Whole Plant
9.	*Achyranthes bidentata* Blume	Amaranthaceae	Raktaapamarga	Herb	Whole Plant
10.	*Acorus calamus* L.	Araceae	Vachaa	Herb	Rhizomes
11.	*Adenia hondala* (Gaertner) de Wilde	Passifloraceae	Vidari	Climber(h)	Tubers
12.	*Adhatoda beddomei* C.B. Clarke	Acanthaceae	Vaasaa	Herb	Whole plant
13.	*Adhatoda zeylanica* Medic.	Acanthaceae	Vaasaa	Shrub	Leaves
14.	*Aegle marmelos* (L.) Corr. ex Schultz	Rutaceae	Vilva	Tree	Roots
15.	*Aerva lanata* (L.) Juss.	Amaranthaceae	Pashanabheda	Herb	Whole Plant
16.	*Aerva wightii* Hook .f.	Amaranthaceae		Shrub	Whole Plant
17.	*Alangium salvifolium* (L.f.) Wang.	Alangiaceae	Ankola	Tree	Roots
18.	*Albizzia lebbek* (L.) Willd.	Mimosaceae	Sireesha	Tree	Bark,Gum,Seed
19.	*Albizzia odoratissima* (L.f.) Benth.	Mimosaceae	Sireesha	Tree	bark
20.	*Aloe barbadensis* Mill.	Uliaceae	Kumaree	Shrub	Leaves
21.	*Alpinia galanga* Sw.	Zingiberaceae	Raasna	Herb	Rhizomes
22.	*Alstonia scholaris* (L.) R.Br.	Apocynaceae	Saptaparma	Tree	Bark
23.	*Alternanthera sessilis* (L.) R.Br, ex DC.	Amaranthaceae	Matsyaakshee	Herb	Whole Plant
24.	*Amaranthus spinosus* L.	Amaranthaceae	Tandulasahavaya	Herb	Roots
25.	*Ammania baccifera* L.	Lythraceae	Pashanabhedha	Herb	Whole Plant
26.	*Amorphophalus companulatus* (Roxb.) Bl. ex Decaisne	Araceae	Sooranah	Herb	Corm
27.	*Ampelocissus araneosa* (Dalz.& Gibs.) Planch.	Vitaceae	Asvakathara	Climber (W)	Roots
28.	*Ampelocissus amottiana* Planch.	Vitaceae	Asvakathara	Climber (W)	Roots
29.	*Anacardium occidentale* L.	Anacardiaceae	Kajutaka	Tree	Bark, Seeds
30.	*Andrographis paniculata* (Burm. f.) Wall, ex Nees	Acanthaceae	Kiraatatikta	Herb	Whole Plant
31.	*Anisomeles malabarica* (L.) R.Br, ex Sims	Lamiaceae	Sprakka	Herb	Roots
32.	*Anthocephalus indicus* A. Rich.	Rubiaceae	Kadamba	Tree	Roots
33.	*Aphanamixis polystachya* (Wall.) Parker	Meliaceae	Rohitaka	Tree	Bark
34.	*Areca catechu* L.	Arecaceae	Kramuka	Tree	Roots, Fruits
35.	*Aristoiochia bracteata* Lam.	Aristolochiaceae	Kitamari	Herb	Whole Plant
36.	*Aristolochia indica* L.	Aristolochiaceae	Eesvaree	Climber(h)	Roots
37.	*Aristoiochia tagala* Cham.	Aristolochiaceae	Eesvaree	Climber(h)	Roots
38.	*Artimisia indica* Willd.	Asteraceae	Naagapushpa	Shrub	Flowers
39.	*Asparagus racemosus* Willd.	Liliaceae	Sataavaree	Herb	Roots
40.	*Asparagus rottleri* Baker.	Liliaceae		Herb	Roots
41.	*Azadirachta indica* A. Juss.	Meliaceae	Nimba	Tree	Leaves
42.	*Bacopa monnieri* (L.) Pennel	Scrophulariaceae	Brahmee	Herb	Whole Plant
43.	*Balanites aegyptiaca* (L.) Delile	Simaroubaceae	Ingudee vriksha	Tree	Bark
44.	*Baliospermum montanum* (Willd.) Muell-Arg.	Euphorbiaceae	Danti	Shrub	Roots
45.	*Bambusa arundinacea* (Retz.) Roxb.	Bambusaceae	Vamsa	Shrub	Resin
46.	*Basella alba* L.	Basellaceae	Upodaka	Climber(h)	Whole Plant
47.	*Bauhinia racemosa* Lam.	Caesalpiniacdae	Asmantaka	Shrub	Roots
48.	*Bauhinia tomentosa* L.	Caesalpiniaceae	Asmantaka	Shrub	Roots
49.	*Biophytum reinwardtii* Edgw. & Hook. f.	Oxalidaceae	Lajjalu	Herb	Whole Plant
50.	*Biophytum sensitivum* (L.) DC.	Oxalidaccae	Lajjalu	Herb	Whole Plant
51.	***Boerhaavia diffusa* L**	Nyctaginaceae	Punarnava	Herb	Whole Plant
52.	***Bombax ceiba L.***	Bombacaceae	Saalmalee	Tree	Bark, gum

■ CAMP 1 ▲ CAMP 2 ■ & ▲ CAMP 1 & 2 ● CAMP 3

53.	*Borassus flabellifera* L.	Arecaceae	Taala	Tree	Fruit
54.	*Boswellia serrata* Roxb.	Burseraceae	Sallakee	Tree	Gum
55.	*Breynia retusa* (Denst) Alston	Euphorbiaceae	Kamboji	Shrub	Whole Plant
56.	*Breynia vitis-idaea* (Burm.f.) Fischer	Euphorbiaceae	Arunii	Shrub	Stem
57.	*Buchanania Ianzan* Spreng.	Anacardiaceae	Priyangu	Tree	Fruits
58.	*Butea monosperma* (Lara.) Taub.	Fabaceae	Palaasa	Tree	Bark, Fl.&Seed
59.	*Caesalpinia bonduc* (L.) Roxb.	Caesalpiniaceae	Kubaerakshi	Shrub	Roots, Seeds
60.	*Caesalpinia sappan* L.	Caesalpiniaceae	Patangam	Shrub	Bark
61.	*Calophyllum inophyllum* L.	Clusiaceae	Punnaga	Tree	Flowers
62.	*Calotropis gigantea* (Linn.) R.Br.	Asclepiadaceae	Arka	Herb	Roots, Lvs
63.	*Calycopteris floribunda* Lam.	Combretaceae	Pullani	Shrub	Fruits, lvs
64-	*Canarium strictum* Roxb.	Burseraceae		Tree	Stem
65.	*Cardiospermum halicacabum* L.	Sapindaceae	Kaakatikta	Climber(h)	Whole Plant
66.	*Cassia absus* L.	Caesalpiniaceae	Caksusya	Herb	Seed, Resin
67.	*Cassia auriculata* L.	Caesalpiniaceae	Maarkandhee	Shrub	Seeds
68.	*Cassia fistula* L.	Caesalpiniaceae	Aaragvaddha	Tree	Bark,fr-fl
69.	*Cassia senna* L.	Caesalpiniaceae	Sanna	Shrub	Leaves
70.	*Cassia tora* L.	Caesalpiniaceae	Chakramarda	Herb	Roots, Seeds
71.	*Cayratia pedata* Juss.	Vitaceae	Godhapadi	Climber(h)	Whole plant
72.	*Celastrus paniculata* Willd.	Celastraceae	Jyotishmatee	Liana	Seeds
73.	*Centella asiatica* (L.) urban	Apiaceae	Brahmee	Herb	Whole Plant
74.	*Chonemorpha fragrans* (Moon) Alston	Apocynaceae	Murva	Liana	Roots
75.	*Cinnamomum macrocarpum* Hook.f.	Lauraceae		Tree	Roots
76.	*Cinnamomum wightii* Meissan.	Lauraceae	Tejpatra	Tree	Bark
77.	*Cinnamomum zeylanicum* Bl.	Lauraceae	Tvak	Tree	Bark
78.	*Cissus quadrangularis* L.	Vitaceae	Vajravalee	Herb	Whole plant
79.	*Citrullus colocynthis* (L.) Sch.	Cucurbitaceae	Indravarunee	Herb	Roots, Fruits
80.	*Citrus medica* L.	Rutaceae	Beejapoora	Shrub	Fruit
81.	*Cleome burmanni* Wt & Am.	Capparidaceae		Herb	Whole Plant
82.	*Cleome viscosa* L.	Capparidaceae	Tilaparni	Herb	Whole Plant
83.	*Clerodendrum serratum* (L.) Moon	Verbenaceae	Bharngee	Shrub	Roots
84.	*Clitoria ternatea* L.	Fabaceae	Shankhapushpee	Climber(h)	Roots
85.	*Coccinia grandis* (L) Voigt	Euphorbiaceae	Bimbi	Shrub	Stem, Fruits
86.	*Cocos nucifera* L.	Arecaceae	Naarikaela	Tree	Flower
87.	*Coleus vettiveroides* K.C.Jacob.	Lamiaceae	Hreevaera	Shrub	Stem
88.	*Commiphora mukul* Engl.	Burseraceae	Guggulu	Tree	Gum-resin
89.	*Coscinium fenestratum* (Gaertn.) Coleb.	Menispermaceae	Daaruharidraa	Climber(w)	Stem
90.	*Costus speciosus* (Koen.) Sm.	Costaceae	Pushkaramoolam	Herb	Roots
91.	*Crataeva magna* (Lour.) DC.	Capparidaceae	Varuna	Tree	Leaves
92.	*Cryptolepis buchanani* Roem . & Schultz	Periplocaceae	Krishna saariva	Climber(w)	Roots
93.	*Curculigo orchioides* Gaertn.	Hypoxidaceae	Musalee	Herb	Roots
94.	*Cycas circinalis* L.	Cycadaceae	Varaguna	Tree	Fruit
95.	*Cyclea fissicalyx* Dunn	Minispermaceae		Climber(w)	Roots
96.	*Cyclea peltata* Hook.f. & Th.	Minispermaceae	Pathaa	Climber(w)	Roots
97.	*Cynodon dactylon* (L.) Pers.	Poaceae	Doorva	Grass	Whole Plant
98.	*Cyperus esculentus* L.	Cyperaceae	Mustaa	Herb	Roots
99.	*Cyperus rotundus* L.	Cyperaceae	Mustaa	Herb	Rhizomes
100.	*Dalbergia sissoo* Roxb.	Fabaceae	Simsipaa	Tree	Wood
101.	*Datura metel* L.	Solanaceae	Dhatoora	Herb	Leaves, fl.
102.	*Decalepis hamiltonii* Wt. & Arri.	Asclepiadaceae	Saariva	Liana	Root
103.	*Dendropthoe falcata (L.f.) EL*	Loranthaceae	Bandak	Shrub	Stem
104.	*Desmodium biarticulatum (L.) F.v.Muell.*	Fabaceae		Shrub	Roots
105.	*Desmodium gangeticum (L.) DC.*	Fabaceae	Salaparni	Shrub	Roots
106.	*Desmodium triflorum (L.) DC.*	Fabaceae	Hamsapadi	Herb	Whole Plant
107.	*Dioscorea bulbifera L.*	Dioscoreaceae	Varahee	Climber	Tubers

108.	*Dioscorea glabra* L.	Dioscoreaceae	Sankhaluka	Liana	Tubers
109.	*Dioscorea oppositifolia* L.	Dioscorcaceae	Amlardraka	Liana	Tubers
110.	*Dioscorea tomentosa* Koen. ex Spreng.	Dioscoriaceae		Climber(h)	Tubers
111.	*Drosera indica* L.	Droseraceae		Herb	Whole Plant
112.	*Drosera peltata* Sm.Willd.	Droseraceae		Herb	Whole Plant
113.	*Dryopteris filix-mas* (Linn.) Schott	Dryoteridaceae (Pterdiophyte)		Fern	Rhizomes
114.	*Eclipta alba* (L.) Hassk.	Asteraceae	Bhrangarajaa	Herb	Whole Plant
115.	*Elaeagnus conferta* Roxb.	Elaeagnaceae		Shrub	
116.	*Elaeocarpus serratus* L.	Elaeocarpaceae	Rudraksha	Tree	Seeds
117.	*Elaeocarpus tuberculatus* Roxb.	Elaeocarpaceae	Rudraksha	Tree	Seeds
118.	*Elletaria cardamomum* (L.) Manton	Zingiberaceae	Aela	Herb	Fruits, Seeds
119.	*Embelia ribes* Burm. f.	Myrsinaceae	Vidhanga	Liana	Fruits
120.	*Embelia tsjeriam-cottam* (R.& S.) DC.	Myrsinaceae	Vidhanga	Liana	Fruits
121.	*Emblica officinalis* Gaertn.	Euphorbiaceae	Aamalakee	Tree	Fruits
122.	*Emilia sonchifolia* (L.) DC.	Asteraceae	Sasasruti	Herb	Whole Plant
123.	*Erythrina stricta* Roxb.	Fabaceae	Paaribhadra	Tree	Bark, Leaves
124.	*Erythrina suberosa* Roxb.	Fabaceae		Tree	Bark, Leaves
125.	*Erythrina variegata* L.	Fabaceae	Paaribhadra	Tree	Bark, Leaves
126.	*Euphorbia antiquorum* L.	Euphorbiaceae	Snuhee	Tree	Stem
127.	*Euphorbia nerifolia* L.	Euphorbiaceae	Snuhee	Tree	Roots, Leaves
128.	*Euphorbia thymifolia* L.	Euphorbiaceae	Dugdhika	Herb	Whole Plant
129.	*Evolvulus alsinoides* L.	Convolvulaceae	Shankhapushpee	Herb	Whole Plant
130.	*Feronia elephantum Con.*	Rutaceae	Kapittha	Tree	Fruits
131.	*Ficus bengalensis* L.	Moraceae	Vatha	Tree	Bark, Root
132.	*Ficus racemosa* L.	Moraceae	Udumbara	Tree	Bark, Root
133.	*Ficus religiosa* L.	Moraceae	Asvattha	Tree	Bark, Root
134.	*Ficus retusa* L.	Moraceae	Plaksha	Tree	Bark
135.	*Ficus tsjahela* Burm f.	Moraceae	Plaksha	Tree	Bark
136.	*Flacourtia indica* (Burm.) Herr.	Flacourtiaceae	Taaleesa	Tree	Bark
137.	*Fumaria indica* (Haussk) Pugsley	Fumariaceae	Parpathaka	Herb	Whole Plant
138.	*Garcinia gummigutta* (L.) Rob.	Cluciaceae		Tree	Resin
139.	*Garcinia indica* Choisy	Cluciaceae	Vrakshaamla	Tree	Seeds
140.	*Garcinia morella* (Gaertn.) Desr.	Cluciaceae	Tamala	Tree	Resin
141.	*Gardenia gummifera L.f.*	Rubiaceae	Hingupatree	Tree	Resin(fl)
142.	*Gardenia resinifera* Roth	Rubiaceae	Nadihingu	Tree	Resin(fl)
143.	*Gloriosa superba* L.	Liliaceae	Laangalee	Herb	Tubers
144.	*Glycosmis macrocarpa* Wt.	Rutaceae		Shrub	Fruits
145.	*Gmelina arborea* Roxb.	Verbenaceae	Gambharee	Tree	Roots
146.	*Gymnema sylvestre* (Retz) Schuitt	Asclepiadaceae	Maeshasringa	Climber(w)	Leaves
147.	*Hedychium coronarium* Koenig	Zingiberaceae	Sathhee	Herb	Rhizomes
148.	*Helicteris isora* L.	Sterculiaceae	Avartani	Shrub	Fruits
149.	*Heliolropium indicum* L.	Boraginaceae	Vrscikali	Herb	Roots
150.	*Heliotropium keralense* Siv..& Mani.	Boraginaceae	Vrscikali	Herb ,	Roots
151.	*Hemidesmus indicus* (L.) R.Br.	Asclepiadaceae	Saarivaa	Climber(w)	Roots
152.	*Holarrhena antidysentrica* (Roth) A.DC.	Apocynaceae	Kuthaja	Shrub	Bark
153.	*Holoptelea integrifolia* (Roxb.) Planch.	Ulmaceae	Chirivilva	Tree	Bark.Lvs
154.	*Holostemma annulare* (Roxb.) K. Schum.	Asclepiadaceae	Jeevantee	Liana	Roots
155.	*Hydnocarpus macrocarpa* (Beddome) Warb.	Flacourtiaceae	Tuvarakah	Tree	Seeds
156.	*Hydnocarpus wightiiana* Bl.	Flacourtiaceae	Tuvarakah	Tree	Seeds
157.	*Hygrophilla auriculata* (Schum.) Hiene	Acanthaceae	Kokilaksah	Herb	Roots,Leaves,Seeds
158.	*Ichnocarpus frutescens* (L.) R.Br.	Apocynaceae	Krishnasaariva	Liana	Stems
159.	*Indigofera tinctoria* L.	Fabaceae	Neelee	Shrub	Whole Plant
160.	*Ipomea nil* (L.) Roth	Convolvulaceae	Krishnabeeja	Herb	Seeds
161.	*Ipomea obscura* (L.) Ker-gawl.	Convulvulaceae	Lakshamana	Herb	Leaves

162.	*Ipomea paniculata* R.Br.	Convulvulaceae	Ksheeravidaaree	Climber(h)	Whole Plant
163.	*Ixora coccinea* L.	Rubiaceae	Paraantee	Shrub	Flowers, Roots
164.	*Jasminum anguistifolia* (L.) Willd.	Oleaceae	Malati	Climber (w)	Flowers & leaves
165.	*Jasminum grandiflorum* L.	Oleaceae	Jaatee	Climber(w)	Roots, bud
166.	*Jatropha curcas* L.	Euphorbiaceae	Dravantee	Shrub	Roots
167.	*Janakia arayalpatra* Joseph & Chandrasekharan	Periplocaceae		Shrub	Roots
168.	*Kaempferia galanga* L.	Zingiberaceae	Sathhee	Herb	Roots
169.	*Kaempferia rotunda* L.	Zingiberaceae	Bhumicampaka	Herb	Tubers
170.	*Kingiodendron pinnatum* (Roxb.ex DC)	Caesalpinaceae		Tree	Wood,Resin
171.	*Lamprachaenium microcephalum* Benth.	Asteraceae	Ajadandi	Herb	Whole Plant
172.	*Leptadenia reticulata* (Retz.) Wight & Am.	Asclepiadaceae	Jeevantee	Shrub	Stems
173.	*Luffa* spp.	Cucurbitaceae	Daevadalee	Climber(h)	Seeds
174.	*Lobelia nicotinifolia* Heyne	Campanulaceae	Vibhishina	Herb	Whole Plant
175.	*Madhuca diplostemon* (Clarke) Royen	Sapotaceae		Tree	
176.	*Madhuca insignis* (Radlk) Lam.	Sapotaceae		Tree	
177.	*Madhuca longifolia* (Koen) Macbr.	Sapotaceae	Maddhooka	Tree	Wood, Flowers
178.	*Maesa indica* (Roxb) Dc.	Myrsinaceae		Shrub	Fruits
179.	*Mallotus phillipensis* (Lam.) Mull - Arg.	Euphorbiaceae	Kampillaka	Tree	Fruits
180.	*Mangifera indica* L.	Anacardiaceae	Aamba	Tree	Seeds
181.	*Marsilea quandrifolia* L.	Marsiliaceae	Sunishannka	Herb	Whole Plant
182.	*Mappia foetida* Miers.	Icacinaceae		Tree	Seeds& Bark
183.	*Merremia tridentata* (L.) Hall.f.	Convolvulaceae	Prasaarinee	Herb	Whole Plant
184.	*Mesua ferrea* L.	Clusiaceae	Nagakaesara	Tree	Flowers
185.	*Michelia champaca* L.	Magnoliaceae	Champaka	Tree	Flowers
186.	*Mimosa pudica* L.	Mimosaceae	Lajjalu	Herb	Whole Plant
187.	*Mimusops elengi* L.	Sapotaceae	Bakula	Tree	Flowers
188.	*Mitragyna parvifolia* (Roxb.) Korth.	Rubiaceae	Bhumi kadamba	Tree	Bark, Leaves
189.	*Monochoria vaginalis* (Burm .f.) C. Presl. ex Kunth	Pontederiaceae		Herb	Tubers
190.	*Moringa concanensis* Nimmo ex Dalz. & Gibs	Moringaceae	Sigru	Tree	Bark, leaves
191.	*Moringa oleifera* Lam.	Moringaceae	Sigru	Tree	Bark, Roots
192.	*Mucuna pruriens* (L.) DC.	Fabaceae	Kapikacchu	Climber(h)	Seeds
193.	*Murraya koenighii* (L) Spr.	Rutaceae	Karivaempu	Shrub	Leaves
194.	*Mussaenda frondosa* L.	Rubiaceae	Shrivati	Shrub	Leaves
195.	*Myristica dactyloides* Gaertn.	Myristicaceae	Jatiphala	Tree	Seed (Aril)
196.	*Myristicafragrans* Houtt.	Myristicaceae	Jatiphala	Tree	Seed (Mace)
197.	*Myristica malabarica* Lam.	Myristicaceae	Jatiphala	Tree	Seed(aril)
198.	*Nelumbo nucifera* Gaertn.	Nelumbonaceae	Kamalam	Herb	Stem, stamens
199.	*Nerium indicum* Miller	Apocynaceae	Svaehna	Shrub	Roots
200.	*Nervilia aragoana* Gaud.	Orchidaceae	Padmacharini	Herb	Whole Plant
201.	*Nigella saliva* L.	Nigellaceae	Kaaravee	Herb	Seeds
202.	*Nilgiridnthus ciliatus* (Nees) Bremek.	Acanthaceae	Sahacarah	Shrub	Leaves, roots
203.	*Nymphaea nouchali* Burm.f.	Nymphaeaceae	Indeevararn	Climber(h)	Rhizome, Seed
204.	*Ochreinauclea missionis* (Wall, ex G.Don) Ridsdale	Rubiaceae	Jalamdasa	Tree	Bark
205.	*Ocimum basilicum* L.	Lamiaceae	Arjaka	Herb	Leaves
206.	*Ocimum sanctum* L.	Larniaceae	Thulasee	Shrub	Roots
207.	*Oldenlandia corymbosa* L.	Rubiaceae	Parpatha	Herb	Whole Plant
208.	*Operculina turpethum* (L.) Silva Manso.	Convolvulaceae	Travrat	Climber(h)	bark
209.	*Oroxylum indicum (L.)* Benth. ex Kurtz.	Bignoniaceae	Aralu	Tree	Roots
210.	*Oxalis corniculata* L.	Oxalidaceae	Charangaeree	Herb	Whole Plant
211.	*Pandanus tectorius* Parkinson	Pandanaceae	Ketaki	Tree	Root ,

212.	*Paphiopedylium druryi* P.Fitz.	Orchidaceae		Herb	Flowers
213.	*Pedalium murex* L.	Pedaliaceae	Brahtgokshura	Herb	Whole Plant
214.	*Peganum harmala* L.	Zygophyllaceae	Soma	Herb	Seeds
215.	*Phaseolus trilobus* (L.) Aiton	Fabaceae	Mudgaparnee	Herb	Roots
216.	*Phoenix pusilla* Gaertn.	Arecaceae		Tree	Roots
217.	*Phyllanthus amarus* Schurn. & Thonn.	Euphorbiaceae	Taamalakee	Herb	Whole Plant
218.	*Phyllanthus madraspatensis* L.	Euphorbiaceae	Bhumyamalalci	Herb	Whole Plant
219.	*Phyllanthus reticulatus* Poir.	Euphorbiaceae	Krishna Kamboji	Shrub	Roots
220.	*Phyllanthus rheedii* Wt.	Euphorbiaceae		Shrub	Roots
221.	*Phyllanthus urinaria* L.	Euphorbiaceae	Bhumyamalaki	Shrub	Roots
222.	*Piper barberi* Gamble.	Piperaceae		Shrub	
223.	*Piper longum* L.	Piperaceae	Pippali	Shrub	Fruits, Roots
224.	*Piper mullesua* Buch.-hara. ex D.Don	Piperaceae	Gaja pippali	Climber(h)	Roots
225.	*Piper nigrum* L.	Piperaceae	Maricha	Shrub	Fruits
226.	*Plumbago rosea* L.	Plumbaginaceae	Chitraka	Shrub	Roots
227.	*Plumbago zeylanica* L.	Plumbaginaceae	Chitraka	Herb	Roots
228.	*Polygonum glabrum* Willd.	Polygonaceae		Herb	Roots, leaves
229.	*Pongamia pinnata* L.	Fabaceae	Karanja	Tree	Baric, Seeds
230.	*Portulaca oleracea* L.	Portulacaceae	Lonikaa	Herb	Whole Plant
231.	*Premna serratifolia* L.	Vebenaceae	Agnikanttha	Tree	Roots
232.	*Pseudarthria viscida* (L.) Wt & Am.	Fabaceae	Salapamee	Climber(h)	Roots
233.	*Psoralea corylifolia* L.	Fabaceae	Baakuchee	Herb	Seeds
234.	*Pterocarpus marsupium* Roxb.	Fabaceae	Asana	Tree	Wood
235.	*Pterocarpus santalinus* L.F.	Fabaceae	Aguru	Tree	Wood
236.	*Puereria tuberosa* (Roxb. ex Willd.) DC.	Fabaceae	Vidaree	Climber(w)	Tubers
237.	*Raphidophora pertusa* (Roxb.) Schott	Araceae	Gaja pippali	Liana	Stem
238.	*Rauwolfia serpentina* Benth.	Apocynaceae	Sarpagandha	Shrub	Roots
239.	*Rotula aquatica* Lour.	Boraginaceae	Pashanabheda	Shrub	Roots
240.	*Rubia cordifolia* L.	Rubiaceae	Manjishtha	Climber (h)	Stems
241.	*Saccharum spontamum* L.	Poaceae	Kasha	Herb	Stem
242.	*Salacia reticulata* Wt.	Hipocrataceae	Ekanayakam	Shrub	Roots
243.	*Santalum album* L.	Santalaceae	Chandana	Tree	Wood
244.	*Sapindus laurifolius* Vahl.	Sapindaceae	Arista	Tree	Fruit
245.	*Saraca asoca* (Roxb.) Willd.	Caesalpiniaceae	Asoka	Tree	Bark
246.	*Sarcostemma acidum* (Roxb) Voigt	Asclepiadaceae	Soma	Herb	Whole Plant
247.	*Schizachyrium* exile (Hochst.) Stapf	Poaceae	Sprakka	Herb	Whole Plant
248.	*Schrebera swietenioides* Roxb.	Oleaceae	Mushkaka	Tree	Roots
249.	*Scindapsus officinalis* Schott.	Araceae	Chavikaa	Climber(w)	Fruits
250.	*Semecarpus anacardium* L.f.	Anacardiaceae	Bhallatama	Tree	Fruits
251.	*Shorea robusta* Garten.	Dipterocarpaceae	Kaushika	Tree	Resjn
252.	*Sida acuta* Burm. f.	Malvaceae	Balaa	Herb	Roots
253.	*Sida cordifolia* L.	Malvaceae	Balaa	Herb	Stem
254.	*Sida rhombifolia* L.	Malvaceae	Balaa	Herb	Roots
255.	*Solanum indicum* L.	Solanaceae	Brhatee	Shrub	Roots
256.	*Solanum melongena* Var. insanum L.	Solanaceae	Brhatee	Shrub	Roots, Lvs,Fr
257.	*Solanum nigrum* L.	Solanaceae	Kaakamachee	Herb	Whole Plant
258.	*Solanum xanthocarpum* Sch. & Wendl.	Solanaceae	Brhatee	Herb	Whole Plant
259.	*Sphaeranlhus indicus* L.	Asteraceae	Alambushaa	Herb	Roots
260.	*Spondias pinnata* (L.f.) Kurz	Anacardiaceae	Aamraata	Tree	Bark
261.	*Sterculia foetida* L.	Sterculiaceae	Arimaeda	Tree	Seed
262.	*Sterculia guttata* Roxb.	Sterculiaceae		Tree	Seed, gum
263.	*Stereospermum chelonoides* (L.f.) DC	Bignoniaceae	Pathaala	Tree	Roots
264.	*Streblus asper* Lour.	Moraceae	Sakhuthaka	Tree	Roots

265.	*Strychnos colubrina* L.	Strychnaceae	Anjanaki	Climber(w)	Wood, Lvs& Roots
266.	*Strychnos nux-vomica* L.	Strychnaceae	Kupilu	Tree	Fruits
267.	*Strychnos potatorum* L.f.	Strychnaceae	Kataka	Tree	Fruits
268.	*Swertia corymbosa* (Griscb.) Wt ex Clarke	Gentianaceae	Kiratankta	Herb	Whole Plant
269.	*Swertia lawii* (Clarke) Barkill	Gentianaceae	Kiratatikta	Herb	Whole Plant
270.	*Symplocos cochinchinensis* **(Lour) Moore**	Symplocaceae	Lodhrah	Tree	Bark
271.	*Symplocos racemosa* Roxb.	Symplocaceae	Lodhrah	Tree	Bark
272.	*Syzygium caryophyllatum* (L.) Alston	Myrtaceae	Vajrakanda	Tree	Flower
273.	*Syzygium cumini* (L.) Skees	Myrtaceae	Jamboo	Tree	Bark
274.	*Syzygium travancoricum* Gamble	Myrtaceae		Tree	Bark
275.	*Tamarindus indica* L.	Caesalpiniaceae	Amleeka	Tree	Bark
276.	*Tectona grandis* L.f.	Verbenaceae	Saaka	Tree	Wood, Roots
277.	*Tephrosia hirta* (Buch.-Ham.) Gamble	Fabaceae	Sarapunkha	Shrub	Whole Plant
278.	*Tephrosia purpurea* (L.) Pers.	Fabaceae	Sarapunkha	Shrub	Whole Plant
279.	*Terminalia arjuna* (Roxb, ex DC.) Wt. & Am.	Combretaceae	Arjuna	Tree	Bark
280.	*Terminalia belierica* (Gaertn.) Roxb.	Combretaceae	Vibheetaka	Tree	Fruits
281.	*Terminalia chebula* Retz.	Combretaceae	Hareetakee	Tree	Fruits
282.	*Thespesia populnea* (L.) Soland	Malvaceae	Nandeevraksha	Tree	Bark
283.	*Tinospora cordifolia* (Willde) Hook. & Th.	Menispermaceae	Guduchi	Climber(w)	Stems, Seeds
284.	*Tinospora sinensis* (Lour.) Merr.	Menispermaceae	Guduchi	Climber(w)	Stem
285.	*Toddalia asiatica* (L.) Lam.	Rutaceae	Yavaanee	Shrub	Roots, Bark
286.	*Tragia bicolor* Miq.	Euphorbiaceae	Duralabha	Climber(h)	Roots
287.	*Tragia involucrata* L	Euphorbiaceae	Duralabha	Climber(h)	Roots
288.	*Trianthema portulacastrum* L.	Aizoaceae	Punamava	Herb	Whole Plant
289.	*Tribulus terrestris* L.	Zygophyllaceae	Gondhura	Herb	Roots
290.	*Trichopus zeylanicus* Gaertn.	Dioscoriaceae	Varahi	Herb	
291.	*Trichosanthes anaimalaienis* Beddorne	Cucurbitaceae	Vissala	Liana	Roots
292.	*Trichosanthes cucumerina L.*	Curcurbitaceae	Pathola	Shrub	Roots
293.	*Tylophora indica* (Burm. f.) Merr.	Asclepiadaceae	Arkaparni	Shrub	Roots
294.	*Utleria salacifolia* Beddorne	Ascelpiadaceae		Shrub	
295.	*Uraria lagopodioides* (L.) Desv.	Fabaceae	Salaparni	Shrub	Whole Plant
296.	*Valeria indica* L.	Dipterocarpaceae	Sarja	Tree	Resin
297.	*Valeria macrocarpa* B.L.Gupta	Dipterocarpaceae	Sarja	Tree	Resin
298.	*Ventilago madraspatna* Gaertn.	Rhamnaceae	Raktavalli	Climber (h)	Bark
299.	*Vernonia anthelmintica* (L.) Willd.	Asteraceae	Sahadevi	Shrub	Fruits
300.	*Vernonia cinerea* Less.	Asteraceae	Sahadevi	Shrub	Fruits
301.	*Vetiveria zizanioides* (L.) Nash	Graminaceae	Usira	Herb	Roots
302.	*Vitex negundo* L.	Verbenaceae	Nirgundhee	Shrub	Roots
303.	*Vitex trifolia* L.f.	Verbenaceae	Nirgundhee	Tree	Roots
304.	*Withania somnifera* (L.) Dunal	Solanaceae	Ashvagandha	Shrub	Roots
305.	*Woodfodia fruticosa* (L.) Kurz.	Lythraceae	Dhaatakee	Shrub	Flowers
306.	*Zizyphus mauritiana* Lam.	Rhamnaceae	Badara	Tree	Seeds
307.	*Zizyphus oenoplea* (L.) Mill.	Rhamnaceae	Sngala badari	Shrub	Seeds
308.	*Zizyphus xylopyrus* (Retz/) Willd.	Rhamnaceae	Ghonta	Shrub	Seeds

IUCN
The World Conservation Union

Species Survival Commission

Silphion

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Dear Dr. Tandon, Dear Dr. Shankar,

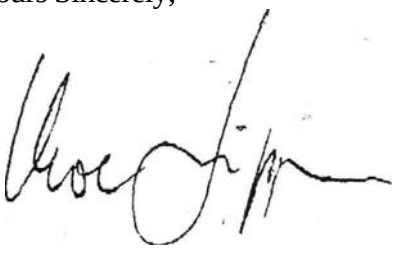
Thank you very much for your fax of December 24 concerning the C.A.M.P. III workshop organized by FRLHT between 16-18 January 1997.

On behalf of the *Medicinal Plant Specialist Group,* Dr. Tony Cunningham and myself want to congratulate FRLHT for this series of workshops. We regard this ongoing initiative as one of the most valuable presently undertaken to assess the threat that medicinal plant taxa are undergoing. Very few of the many medicinal plant projects worldwide focus on the population status and conservation of medicinal plant taxa.

We want to express the MPSG's formal support to your initiative and the forthcoming workshop, If you find it helpful, please feel free to include the MPSG and 1st logo in the workshop documents as formally supporting this initiative.

The recently appointed Executive Secretary of the MPSG, Dr Dana Leaman, will participate in an earlier meeting held in Madras Jan 10-11. .She will hopefuly find an opportunity there to discuss with you the possible role and participation of the MPSG in the forthcoming conference *Medicinal Plants for Survival.*

Yours Sincerely,



Dr Uwe Schippmann

cc: Dr Tony Cunningham

CREDITS

Foundation for Revitalisation of Local Health Traditions

is a non-governmental organisation which was launched to preserve and promote India's traditional medical legacy. The main objective is to increase understanding and awareness of the need for conservation and stress the importance of medicinal plants in primary health care with an "Outreach" programme, a media campaign, publication of educational booklets, setting up *in situ* medicinal plants conservation areas in Southern India and *ex situ* parks. Other ongoing activities include a database network, a research agenda of current projects as well as a publications/education department and a training department. FRLHT was the first organisation in India to utilise the CAMP process to priortise species for conservation and its workshops have provided innovations and additions to the process which have or will be taken up in other countries around the world. CAMP Workshops have become one of FRLHT's regular activities.

Z.O.O. /C.B.S.G, INDIA

Zoo Outreach Organisation is a Positive, Constructive, Practical, Scientific, Sensible and Sensitive Conservation, Education, Research and Animal Welfare Society. Founded to encourage public support of zoos in a positive and constructive manner, ZOO has evolved a role of neutral link between individuals, organisations and institutions involved in wildlife and zoo conservation activities to ensure that all are exposed to current technical information needed for conservation. Z.O.O. represents the **Conservation Breeding Specialist Group, SSC, IUCN, - C.B.S.G., India.** Z.O.O. and C.B.S.G., India jointly act as a catalyst and liaison to organise and facilitate conservation workshops for Indian species. CBSG, India has organised and conducted seven CAMP workshops since 1995.

Conservation Breeding Specialist Group

The Conservation Breeding Specialist Group, SSC, IUCN is a global network of individuals with expertise in species recovery planning, small population biology, reproductive and behavioural biology, captive animal management, and other disciplines. CBSG advises the IUCN, SSC, and other SSC Specialist Groups on the intensive management of small populations in the wild and the uses of captive propagation for conservation. CBSG has developed several conservation assessment "processes" including the CAMP workshop.

MEDICINAL PLANT SPECIALIST GROUP

Medicinal Plants Specialist Group

The Medicinal Plants Specialist Group (MPSG) is a specialist group of the Species Survival Commission of IUCN which concentrates its efforts on high conservation priority medicinal plant species. MPSG promotes the need to identify and deal with threats to medicinal plants at an early stage rather than focusing purely on taxa that are already in decline. The MPSG interacts with local and regional botanists' all over the world to provide technology and expertise on conservation and other issues.

Section II

Discussion and Reference material

Conservation Assessment and Management Plan Workshop (III), for Selected Species of Medicinal Plants of southern India Bangalore, 16 -18 January 1997

Introduction

Convention on Biological Diversity

The Convention on Biological Diversity adopted in Nairobi in May 1992 and signed by more than 150 states in June 1992 at Rio de Janeiro, came into force officially in December 1993. The Convention is a "framework agreement" in that its provisions are expressed as goals and policies (as opposed to "obligations"), leaving the implementation of its provisions up to individual parties (the states) at the national level. In the Convention, the importance of non-governmental organisations in implementing the provisions was specifically mentioned.

Articles in the Convention cover objectives, terminology, principles, legislation, cooperation and strategy as applied to various issues and methodology. One of the very basic methods of organising conservation action is prioritisation. Therefore, Article 7 of the Convention deals with Identification and Monitoring, calling on parties to identify components of biological diversity important for its conservation and sustainable use. Components of an "indicative list" include :

* ecosystems and habitats
* species and communities, and
* described genomes and genes of social, scientific and economic value.

Knowledge of species and communities can reveal crucial facts necessary to the management of ecosystems and habitats as well as to the identification of important genomes and genes. Identification, listing and prioritisation of species is one of the important tasks in conservation. In India, it is well known by biologists across many taxon groups that species information has many gaps. In many instances, the species has not been surveyed or studied since its description, perhaps in the 18th or 19th century. Even species which have been studied more recently in the 20th century require constant attention due to the fact that the very fabric of the earth is changing so rapidly. It is common knowledge today that the ecosystems and habitats which sustain species are deteriorating exponentially as a result of population expansion, industrialisation, and the build-up of facts resulting from decades and centuries of thinking the Earth and its resources were unlimited. Awareness of this fact is, of course, the raison d'etre for the Convention on Biological Diversity itself.

IUCN Red List

Earlier efforts to monitor the earth's resources and activate conservation; measures include the Red Data Books of IUCN, now called the World Conservation Union. The IUCN Red Data Books have provided a guide for species conservation status for the last two decades. A few years ago, it was felt that both the categories and methodology used by individuals compiling the Red Data Books needed review. Over a seven year period, the IUCN Criteria for Endangerment used in compiling Red Data Books, were examined, revised, reviewed and improved over six different iterations. The present system, the IUCN Red List Categories. 1994. is more objective, numerate, and consistent for all groups. The revised IUCN Red

List Categories provide a methodology for assessment and categorisation which can be applied to any group of organisms (except micro-organisms). The revised IUCN Red List criteria is being used now by conservation actioners and scientists all over the world and is considered the best possible method available today for assessing the conservation status of species.

Conservation Assessment and Management Plan

One of the great difficulties of carrying out basic tasks such as identification and monitoring, creation of management and action plans and recovery programmes for species, is coordinating the great mass and variety of specialist knowledge and agency authority. Much time and energy is wasted in duplication of effort, territorial and ownership disputes, and inability to find and adhere to a common ground. The business community, realising the importance of effective communication and teamwork, has developed a broad spectrum of management strategies and tools which are used daily to manage time and human interaction. More and more, the conservation community is recognising the importance of using some of these tools to achieve their goals, rapidly and effectively. The Conservation Breeding Specialist Group (CBSG) of the Species Survival Commission of IUCN has pioneered the use of some these tools in well planned strategic problem-solving and task -performance exercises. CBSG calls these exercises "processes" because ~ in the contemporary conservation scenario — nothing is static except the fact of change itself.

The Conservation Action and Management Plan Workshop was developed by CBSG for the purpose of prioritising species for conservation action. Over the last decade, CBSG has conducted dozens of CAMP workshops for literally thousands of species, using (and thereby testing) whatever was the current iteration of the IUCN Red List Categories as the basic methodology to glean a status ranking. The IUCN Red List guidelines and criteria are used in CAMP workshops to assess and assign a category to each species.

For the CAMP Workshop CBSG has developed a Taxon Data Sheet and a Spreadsheet format which includes parametres necessary to assess the IUCN status as well as provide other useful information necessary for creating management and action plans. A copy of a Sample Taxon Data Sheet is reproduced on the opposite page. The spread sheet organises the information in a concise manner so that it is accessible at a glance. The information in this Report is organised on spread sheets in the Report section, followed by the individual Taxon Data Sheets. A CAMP Workshop also utilises principles of management psychology to guide human interaction. A set of Guidelines for Group Interaction is presented to the workshop participants who agree as a group to work accordingly in order to complete the task. Objective Facilitators (persons trained management and the workshop process) are used to lead and guide the workshop so that individual and professional bias does not affect group decisions and to assist in maintaining the integrity and focus of the workshop.

CAMP Workshops bring together a variety of specialists and enthusiast from academic, government, managerial, and even the commerical sector to evaluate taxa for setting priorities for conservation action. The fear of loss and hope of recovery of species drives CAMP Workshops. Individuals part with unpublished information in order to contribute to a body of information which will provide strategic guidance, for application of intensive management and information gathering. CAMP Workshops results, are, or should be, dynamic, leading to specific conservation activities in forest, market, classroom, courtroom — locally and nationally as well as on the international stage.

Conservation of Medicinal Plants

Medicinal plants are receiving an enormous amount of attention today. The resurgence of interest in natural systems of medicine, in indigenous peoples and practices, the increasing use of parts or extracts or compounds made from medicinal plants, the realisation of the potential loss through both domestic and foreign trade, and the publicity engenered by the Convention on Biodiversity and Gatt treaty have combined to form what is practically a "movement" for medicinal plants.

As individuals and institutions discover new properties, there is a growing number of plants being classified as "medicinal", perhaps due to the identification of a secondary metabolite or the working out of a phytochemical composition which determines medicinal value. Most of medicinal plants in India are so classified because of traditional practices and uses. A search of literature with unprejudiced inclusion of all species listed by someone (in print) as "medicinal" yielded a tally of more than 5,000 species.

The importance of natural systems of medicine, all of which us medicinal plants to a greater extent, can be realised by the fact that in March 1995 the Government of India created a new Department of Indian Systems of Medicine and Homoeopathy which became functional in December 1995. Recognising that Indian systems of medicine attained a high level of development centuries ago which had stagnated to some extent, this Department was set up to solve some of the problems, such as standardisation, intellectual property rights, availability of raw materials and drugs and generally revitalise this area. This Department, in its annual report, has highlighted the fact that non-availability of raw materials for manufacture of ISM&H drugs has become a serious conservation problem and have proposed the creation of large "vanaspati vans" in major states to increase availability of raw materials and contribute to in situ conservation of medicinal plants.

In the 1991 Amendments to the Wildlife (Protection) Act, the Ministry of Environment and Forests, Government of India included six (6) species of plants the majority of which were medicinal for the first time.

In 1994 the Director General of Foreign Trade, on the recommendation of the Ministry of Environment and the Botanical Survey of India, notified a list of 46 species of plants in the negative list of exports, although value added herbal formulations made from these species were allowed. CITES secretariat and others pointed out subsequently that this concession was counterproductive to the *in situ* conservation of those species as they continued to be exploited. Therefore the negative list was amended in April 1996 to prohibit export of extracts and derivatives including value added herbal formulations. However this was kept in abeyance until December 1996 as a concession to the exporters. Since that time the exporters -have approached the Ministry for further concessions.

Recently the Ministry of Environment, Government of India, has taken note of the list of 214 species of medicinal plants assessed over a period of three years in the three southern Indian Medicinal Plants CAMP workshops organised by FRLHT in Bangalore and in the Northern and Central Indian Medicinal Plants CAMP organised under the Biodiversity Conservation Prioritisation Project in Lucknow. The Ministry has proposed a revision of the negative list to be worked out according to the Critically endangered and Endangered species identified in the CAMP workshops. Further, the Ministry has proposed all the CR and EN species for inclusion under Schedule VI of the Wildlife Protection Act, 1972. In addition the Ministry

has notified the State Forest Departments about the results of the CAMP workshops and requested them to take immediate conservation measures for the CR and EN species, including the exercise of care in issuing collection permits and the promotion of cultivation of those species by local people. Finally the Ministry of Environment has proposed cultivation of identifed medicinal plants as one of its centrally sponsored schemes and suggested that the Department of of Indian Systems of Medicine take similar action. This is a very encouraging response to the Conservation Assessment and Management Plan Workshops.

Foundation for Revitalisation of Local Health Traditions

FRLHT is a non-governmental organisation which was launched to preserve and promote India's traditional medical legacy. Its primary objective is to enhance understanding and awareness of the need for conservation and stress the importance of medicinal plants in primary health care with an "Outreach" programme, a media campaign, publication of educational booklets, setting up *in situ* medicinal plants conservation areas in southern India and *ex situ* parks as well as other activities. FRLHT was the first organisation in India to utilise the CAMP process to prioritise species for conservation and the three workshops have inspired innovations to the process which have been used in other workshops around the world.

FRLHT utilises the output of the CAMP Workshop to carry out its objectives of conservation, research and education. Some of the ways CAMP species have been used are :

* Database for CAMP species: FRLHT has collected photographs, negatives, and slides of type specimens as well as references in the Library at Kew Gardens. They have also listed and begun collecting similar material from the Oriental and India Office Library, London. Some of this material is available only in these institutions and will make a useful addition to the national botanical reference respository.

* Maps: Work has been completed on 40 eco-distribution maps of CAMP species assessed as threatened.

* Genome Resource Banking: A Memorandum of Understanding with the National Bureau of Plant Genetic Resources, New Delhi is under consideration for longterm storage of seeds of CAMP targeted threatened species.

* Education: An attractive Red List poster has been designed and printed in four languages. This poster has been distributed or sold in 1996. Stickers of four threatened species from CAMP assessments have been produced. Several thousand of these educational items have been distributed.

* *Ex situ* conservation: Live specimens of 28 CAMP species have been collected and are growing in demonstration gardens of 11 *ex situ* Medicinal Plants Conservation Parks.

The two above examples demonstrate the dramatic use to which both governmental agencies and non-governmental organisations can put information from CAMP Workshops.

CAMP Workshop for Selected Species of Medicinal Plants

A Conservation Action and Management Plan (C.A.M.P.) Workshop for selected species of Medicinal Plants of southern India was held in Bangalore, India from 16 --18 January 1997,

organised by the Foundation for Revitalisation of Local Health Traditions (F.R.L.H.T.). This Workshop was the third in a series of workshops on selected species of rare southern Indian medicinal plants conducted in 1995. 1996, and 1997. Southern Indian Medicinal * Plants CAMP, 1995 was a landmark exercise in that it was the first time a Conservation Action and Management Plan workshop had been carried out exclusively for plants and also on a country-regional basis. The two follow-up workshops, Southern Indian Medicinal Plants CAMPs (1996 and 1997) to assess additional species, many of them recommended by participants of previous workshops, was also an innovative use of the CAMP process.

Nearly three-hundred priority species had been listed by FRLHT on the basis of several criteria, inclusion in Indian Red Data Book for Plants, endemism, commercial demand and other threats perceived by botanists. Plants from this list made up the bulk of species selected for assessment. In CAMP I, 1995, 36 species were assessed. Of these, four were classified as "Data Deficient" and included in the list for CAMP II along with another 40 species for CAMP II. CAMP III included one species which had been in the Data Deficient category from both CAMP I and CAMP II. In the present workshop participants selected additional species for further assessments. In every workshop, suggestions from participants have been incorporated into the CAMP process by the organisers. In this way. the southern Indian botanic community has collaborated, pooling their insight and knowledge, not only in assessing conservation status but in refining the CAMP process and clarifying the IUCN Red List guidelines for use with plants.

The selection of taxa for assessment is not limited to any of the above criteria nor is there a strict methodology that is to be followed. Given the spectrum of values for selecting taxa for assessment — trade value, economic value, medicinal value, phytochemical value, cultural value, etc. — nearly any one or a combination of those could be used. The choice, and the rationale behind the choice is left to organisers. In a short time, a CAMP is to be held in El Salvatore on species of animals which are commonly confiscated by the authorities. Early CAMPs were held globally in order to to prioritise species for captive breeding in zoos; these did not pre-prioritise at all, but simply listed every know species of the taxon group. Today the trend for CAMP workshops is by region (either continental or country) or country such as the rapid assessments of All India amphibians and reptiles done in India as a basis for national planning and fulfillment of Biodiversity Convention commitments.

In the third CAMP on southern Indian medicinal plants about one forth of the taxa were selected by participants at the previous workshop. The CAMP methodology is flexible and can assimilate innovations, improvements and other changes as required by the workshop without compromising the integrity of the exercise.

The CAMP process has benefitted from the FRLHT CAMPs which have contributed innovations and improvements every year. Many of these have been incorporated into workshops internationally making it more relevant and easy to use by botanists and zoologists.

Some of the suggestions generated in the Medicinal Plants CAMP workshops for filling up the Taxon Data Sheets are:

Data Quality: An additional reference has been suggested — Records, herbarium, collection or museum studies and is denoted as "5".

Threats: Many threats have already been listed but some very specific threats to plants in India have been added, such as — "Ls" for landslide; "Gr" for grazing; "Tr" for trampling; "D" for drowning and "Ov" for overexploitation.

Research Recommendations: Since "T" for taxonomic and morphological genetic studies seems not to be completely satisfactory in certain situations such as population management, "G" for genetic management has been added to the list.

Cultivation Recommendations: Unlike animals, captive breeding or in this case cultivation programmes are more readily accepted for plants for sustainable utilisation. .It has been suggested to add another level to the cultivation/ captive breeding programme and that be "Level 4" for cultivation / captive breeding for sustainable use.

Now, there is a plan to reassess the plants covered in the last three CAMPs and bring out a Red Data Book for Medicinal Plants of Southern India. This will be another innovation on the CAMP process by the Foundation for Revitalisation of Local Health Traditions.

The Workshop was conducted with the blessing of the Conservation Breeding Specialist Group, SSC, IUCN (which developed the CAMP Workshop Process) and the Medicinal Plants Specialist Group, SSC, IUCN. The participants of all the workshops included primarily field botanists, botanists from universities and research institutes, local health practitioners and other NGO's including FRLHT and CBSG, India.

Southern Indian Medicinal Plants CAMP III, 1997, was inaugurated by Mr. Darshan Shankar. Director of FRLHT. , Vinay Tandon gave a summary of the last two CAMP Workshops and action taken to realise the recommendations of the workshop. An overview and introduction to CAMP process and the role of CBSG, SSC, IUCN was given by Sally Walker, CBSG Facilitator, who later explained the Groundrules for the CAMP and points in the Briefing Book. Sanjay Molur led the participants through the revised IUCN Red List categories.

Goals of the Workshop

1. To use populations, habitat and threat parametres to assess the conservation status and assign an IUCN Red List ranking to 64 species of southern Indian Medicinal Plants selected by workshop participants of CAMP 1996 and FRLHT,

2. To provide information about the species which would be useful in drawing up Action Plans and Management Plans, including recommendations for *in situ* and *ex situ* management; research, survey and monitoring; cultivation; investigation of limiting factors; taxonomic and other specific research; education and activism.

3. To produce a Conservation Assessment and Management Plan for the 64 species, which after review and comment by workshop participants, would be distributed to all parties interested in medicinal plants conservation.

Participants were assigned to four Working Groups to assess 65 species of medicinal plants, of which 20 had been selected by participants in the 1996 CAMP II, and spent the next three days logging information which was used to make the assessments. Thirty-six species of

medicinal plants were assessed in CAMP I in 1995, 44 in CAMP II in 1996 and 64 in CAMP III, 1997 using the revised IUCN categories of threat. Of the species assessed in previous CAMPs. "Data Deficient" species were carried over to the next exercise and assessed. Except for one species, *Cleome burmanni,* all could be assessed in CAMP I and II. In this Workshop, however, because the species selected are less and less known, there were 9 Data Deficient species.

The 64 plants were divided into four groups of 16 each and each participant was assigned to one of four Working Groups. These were then passed around to all the other groups for additions and corrections. Plenary sessions to review the assessments and discuss controversial points were held from time to time. Results of this carefully guided group process were:

Of the 64 species considered, 35 are endemic to the region. 29 are non-endemic native species extending throughout India or to Southeast Asia or Africa. The endemics were categorised under the threat categories as Critically Endangered (5); Endangered (11); Vulnerable (15); Lrnt (2), DD (2). The non-endemic native species were all classified according to the IUCN categories at the regional level (EN = 10; VU = 9; LRnt = 7; DD = 3). All of the 29 non-endemic species were categorised as Data Deficient at the Global level.

The Draft Report was circulated to all participants and returned with corrections by nearly 50% of particiants. Editorial and other corrections which did not diverge widely from the group concensus were incorporated into the Report. This Report is being circulated to participants as well as policy makers, research institutions, non-governmental organisations and field managers in southern India and the nation's capitol to use in. establishing conservation programmes and protection measures for rare species of medicinal plants.

Results and Discussion

Sixty-four species of medicinal plants were assessed in the .Workshop. Thirty nine families of Angiosperms are represented in this assessment with 5 taxa in Clusiaceae being the most number of taxa assessed in any family. More than 50% of the taxa assessed (35 of 64) are endemic to southern India. Of the endemics, 11 taxa are found in southern Western Ghats, 14 in the Western Ghats, 2 in central and southern Western Ghats, 1 in the Western Ghats and West Coast, 6 in Peninsular India and 1 in southern Eastern Ghats. Twenty-eight taxa are not endemic to southern India and the distribution for one taxon is not known. The list of taxa and the families they belong to are given in Table 1.

The IUCN categories can be applied at three levels, viz. Global, Regional and National.

Global assessment: The term Global Assessment means applying the IUCN categories to a taxon in its entire distributional range. Global here does not mean that the assessment can be made to a taxon with a world-wide distribution. For example, *Paphiopedilum druryi* has a very limited distribution. It is found only on Agasthyamalai peak which comprises the "global distribution" of this species. Hence, it was assessed during CAMP II, Bangalore, 1996 at the Global level. The IUCN categories work best at the Global level or as applied to "political" endemics. "Political" endemics are endemic taxa that do not have a distribution across political boundaries, that is, between nations.

Regional assessment: The term Regional Assessment means applying the IUCN categories to a taxon in part of its distributional range. For example, *Rauvolfia serpentina* (Sarpagandha) is distributed all over India except the Himalaya. This species was assessed only for its distribution in southern India at CAMP I. Bangalore. 1995 and was not assessed for the rest of India; it was assessed at the Regional level. Regional assessment works well in case of a taxon with a wide distribution in India since it gives the status of the taxon for a region, which may differ from its status in other regions. Region-wise conservation measures can be taken up and implemented more effectively and appropriately.

National assessment: The term National Assessment means applying the IUCN categories to a taxon with respect to its distributional range only in India. According to the Draft Guidelines for applying the IUCN Red List categories at the national level, (Gland, Switzerland, 1995), the categories as currently written for Global assessment cannot be applied *per se* to taxa at the National level. Since the guidelines for categorisation at the National level takes into consideration migration of the taxon across political boundaries, factors such as distributional range in the neighbouring countries also needs to be known. It is therefore required to understand the life history of the taxon in question to be able to qualify for any of the criteria of Restricted Distribution, Population Estimates and Number of Mature Individuals. The exercise of a National Assessment can be undertaken only with the participation of experts with species knowledge from all the countries where the taxon is distributed.

The reason the IUCN categories work best when applied to political endemics is because distribution range does not pose problems for assessment. Assessments for all the 35 endemic southern Indian medicinal plants have been made at the Global level. The remaining non-endemic taxa (29) have been assessed Regionally only for southern India and denoted by an "R" following the IUCN category. Regional categorisation has been made for non-endemics because the workshop organisers, FRLHT, targeted southern Indian medicinal plants according to their institutional mandate. Taxa which have distribution with geological barrier such as the sea between southern India and Sri Lanka are not assessed at the National level since there is no known migration of genetic material (either seeds or pollen) between the Indian mainland and Sri Lanka. Similarly, taxa distributed in southern India and the Andaman and Nicobar Islands are also categorised regionally for southern India only.

Table 1. List of taxa assessed in the 1997 medicinal plants CAMP held in Bangalore
(arranged alphabetically family-wise)

Family	**Taxa**
Anacardiaceae	*Semecarpus travancorica* Beddome
Anonaceae	*Uvaria hookeri* King
	= *U. narum* Wallich ex Hook.f. & Thoms, var. *macrophylla* Hook.f. Thoms.
Apiaceae	*Heracleum candolleanum* (Wight & Am.) Gamble
Apiaceae	*Heracleum rigens* Wallich ex DC.
Apocyanaceae	*Chonemorpha fragrans* (Moon) Alston.
	= C. *macrophylla* G.Don
Araceae	*Amorphophallus commutatus* (Schott) Engl.
	= *Conophallus commutatus* Schott
Araceae	*Raphidophora pertusa* (Roxb.) Schott
	= *Pathos pertusa* Roxb.
	= *Monstera pertusa* (Roxb.)
	= *Seindapsus pertusa* (Roxb.) Schott
Asclepiadaceae	*Gymnema khandalense* Santapau
Asclepiadaceae	*Gymnema montanum* (Roxb.) Hook.f. var. *montanum*

Burseraceae	*Cananum strictum* Roxb.
Caesalpiniaceae	*Humboldtia vahliana* Wight
Capparaceae	*Cleome burmanni* Wight & Arn.
Celastraceae	*Celastrus paniculatus* Willd, ssp. *paniculatus*
Combretaceae	*Terminalia arjuna* (Roxb. ex DC.) Wight & Arn
Clusiaceae	*Calophyllum apetalum* Willd.
	= C. *decipiens* Wight
	= *C. wightianum* Wallich ex Planchon & Triana
Clusiaceae	*Garcinia gummi-gutta* (L.) Robson
	= G. *cambogia* (Gaertn.) Desr.
Clusiaceae	*Garcinia rubro-echinata* Kosterm.
	= G. *echinocarpa* Gamble
Clusiaceae	*Garcinia talbotir* Raizada ex Santapau
	= G. *ovalifolius* (Roxb.) Hook.f. var. *macrantha* Hook.f.
	= G. *malabanca* Talbot
Clusiaceae	*Garcinia travancorica* Beddome
Cucurbitaceae	*Luffa umbellata* Klein ex Willd. Roemer
Cucurbitaceae	*Trichosanthes anamalayana* Beddome
Cucurbitaceae	*Trichosanthes cucumerina* L.
Dipterocarpaceae	*Dipterocarpus indicus* Beddome
Dipterocarpaceae	*Shorea tumbuggaia* Roxb.
Ebenaceae	*Diospyros candolleana* Wight
Ebenaceae	*Diospyros paniculata* Dalz.
Elaeocarpaceae	*Elaeocarpus serratus* L.
Euphorbiaceae	*Baliospermum montanum* (Willd.) Muell.-Arg.
	= B. *axillare* Blume
	= *B. polyandrum* Wight
	= *Jatropha montana* Willd.
Fabaceae	*Dalbergia horrida* (Dennst.) Mobb.
	= *D. sympathetica* Nimmo
Flacourtiaceae	*Hydnocarpus alpina* Wight
Flacourtiaceae	*Hydnocarpus pentandra* (Buch.-Ham.) Oken
	= *H. laurifolia* (Dennst.)
Gentianaceae	*Swertia corymbosa* (Griseb.) Wight ex B.Clarke
Gentianaceae	*Swertia lawii* (Wight ex B.Clarke) Burkill
Hippocrateaceae	*Salacia oblonga* Wallich ex Wight & Arn.
Hippocrateaceae	*Salacia reticulata* Wight
Lamiaceae	*Plectranthus nilgherricus* Benth.
Lauraceae	*Cinnamomum malabatrum* (Burm.f.) Blume.
	= C. *macrocarpum* Hook.f.
Lauraceae	*Cinnamomum sulphuratum* Nees.
Lauraceae	*Cinnamomum wightii* Meissner
Lauraceae	*Persea macrantha* (Nees) Kosterm.
	= *Machilus macrantha* Nees
Liliaceae	*Smilax zeylanica L.*
	= *S. macrophylla* Wight
Logainaceae	*Strychnos aenea* A.W. Hill
	= S. *rheedii* Brandis
Magnoliaceae	*Michelia nilagirica* Zenk.
Meliaceae	*Aphanamixis polystachya* (Wallich) Parker
	= *Aglaia polystachya* Wallich
	= *Amoora rohituka* (Roxb.) Wight & Arn.
	= *Andersonia rohituka* Roxb.
Meliaceae	*Dysoxylum malabaricum* Beddome ex Hiern
Moraceae	*Artocarpus hirsutus* Lam.
Myristicaceae	*Knema attenuata* (Wallich ex Hook.f. & Thomson) Warb.
	= *Myristica attenuata* Wallich ex Hook.f. & Thomson
Myristicaceae	*Myristica dactyloides* Gaertner
	= *M. beddomei* King
	= *M. contorta* Warb.
Myrsinaceae	*Embelia tsjeriam-cottam* (Roemer & Schutes) DC.
	= *E. robusta* auct. non Roxb.
Ophioglossaceae	*Helminthostachys zeylanicus* (L.) Hook.
	= *H. dulcis* Kaulf.
Orchidaceae	*Dendrobium ovatum* (Willd.) Kranzl.
Orchidaceae	*Eulophia cullenii* (Wight) Blume

Orchidaceae	*Eulophia ramentacea* Lindl. ex Wight.
	= *E. pratensis* Lindl.
Periplocaceae	*Decalepis hamiltonii* Wight & Arn.
Santalaceae	*Santalum album* L.
Sapindaceae	*Sapindus laurifolia* Vahl
	S. *trifoliatus* sensu Hiern. non L.
Sapotaceae	*Madhuca longifolia* var. *longifolia* (Koering) Macbr.
	= *Bassia longifolia* Koering
Sapotaceae	*Madhuca nerifolia* (Moon) H.J. Lam.
	= *Bassia malabarica* Beddome
Sterculiaceae	*Pterospermum xylocarpum* (Gaertner) Santapau & Wagh
	= *P. heyneanum* Wallich ex Wight & Arn.
Valerianaceae	*Valeriana leschenaultii* DC.
Verbenaceae	*Vitex trifolia* L.
Zingiberaceae	*Alpinia galanga* Sw.
	= *A. rheedii* Wight
Zingiberaceae	*Curcuma pseudomontana* Graham
	= C. *ranadei* Prain
	= *C. montana* sensu Baker
Zingiberaceae	*Curcuma zedoaria* (Christm.) Roscoe
	=C. *zerumbet* Roxb.

IUCN categories

The "revised" version of the IUCN Red List Categories (December 1994) is the product of many inputs from specialists in different groups of taxa all over the world. Red List Categories were first introduced in the early 70s and only in 1991 a revaluation of the categories was done by Georgina Mace and Russel Lande which was called Version 1. For the first time a quantitative approach was introduced in-assessing mammalian taxa. Version 2 and later versions attempted the approach of quantification for assessment for all groups of taxa except microorganisms. Non-threatened categories were also introduced during that evolution of the IUCN categories. The present version has been classified into threatened categories and non-threatened categories and a set of guidelines called criteria help in assessing the status of any taxa. The structure of the categories is given in figure 1.

The IUCN categories also give the option of assigning a taxon which is not threatened to one of the non-threatened categories. The non-threatened categories are termed Lower Risk -near threatened, Lower Risk-least concern and Lower Risk-conservation dependent (see definitions of IUCN categories end of this Report).

In the present workshop, 50 taxa are classified as threatened, 9 as non-threatened and 5 as Data Deficient (Table 2).

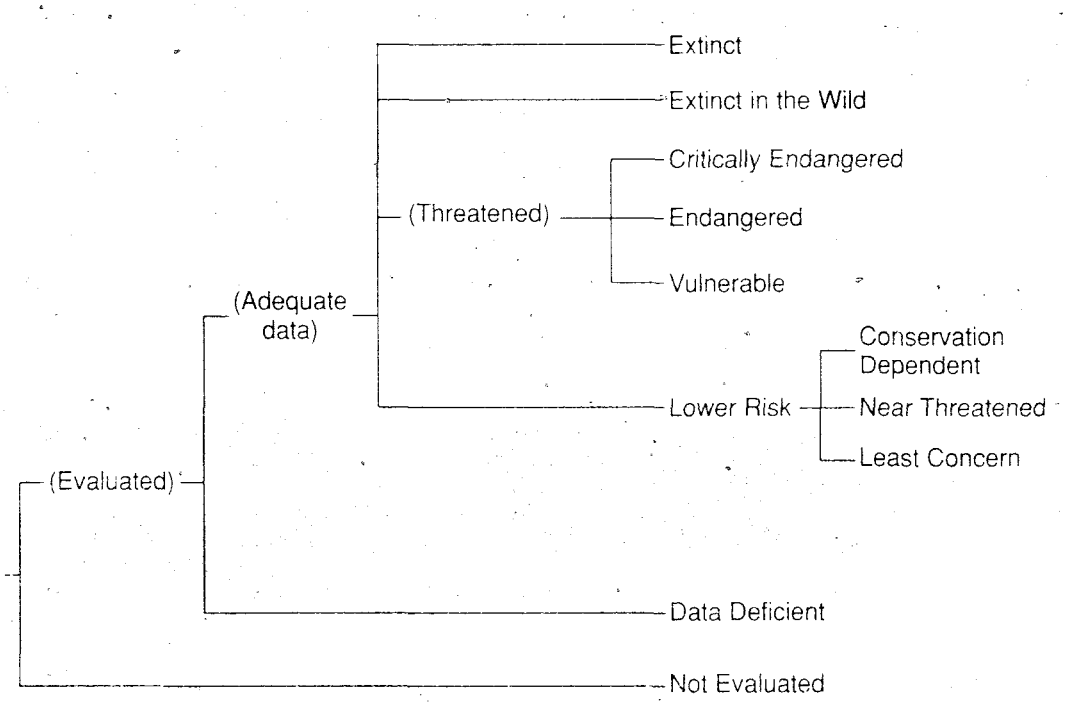
Criteria

The threatened categories of the IUCN Red List - Critically endangered, Endangered and Vulnerable are derived based on 5 criteria (See Criteria for threat categories end of this report), viz:

A. Reduction in population
B. Restricted distribution
C. Population number, restricted distribution and fluctuation
D. Adult population numbers (Mature individuals)
E. Probability of extinction

The subcriteria within each of the above criteria vary to determine if a taxon is Critically Endangered, Endangered or Vulnerable. While assigning a threat category to a taxon, the

Figure 1. Structure of the New IUCN categories



criteria that the threat is based on is also given. Table 2 shows the categories chart along with the criteria to each of the taxon assessed at the 1997 Bangalore CAMP.

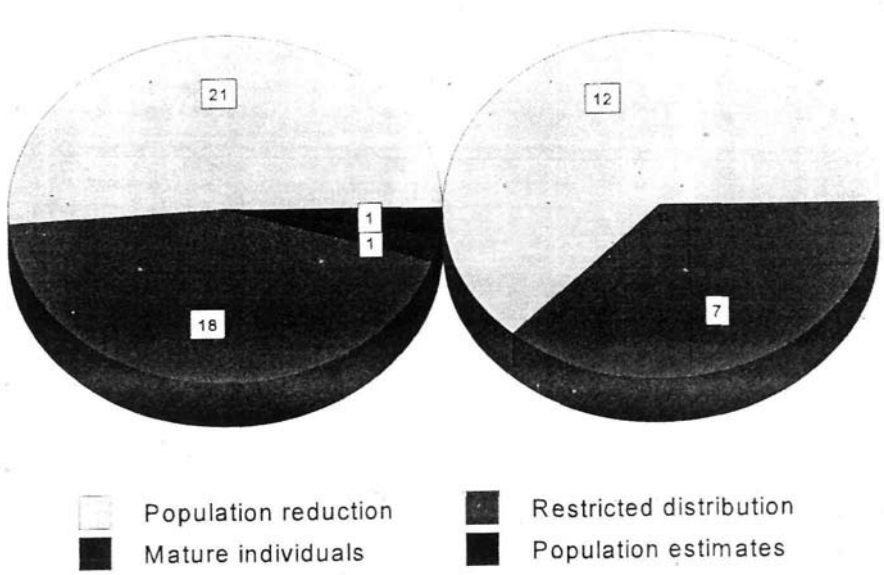
The endemic taxa taken as a whole face a higher degree of threat (89%) as compared to the non-endemic taxa (66%). Comparing the criteria for threat (Figure 2), it is evident that Population Reduction is the main factor for threat categorisation (57%) followed by Restricted Distribution as the second main factor for threat categorisation (43%). Population Estimates and Number of Mature Individuals have been a factor in determining the threat status for only 1 taxon. In 8 cases (14%). both Population Reduction and Restricted Distribution have together contributed to the threat assessment. Since biogeographical endemics do not have wide distribution ranges, it is natural for them to be categorised as threatened based on the Restricted Distribution criterion more than the non-endemic taxa. This is evident in the assessments where 47% of the threatened endemics are categorised based on the Restricted Distribution criterion while only 35% of the threatened non-endemics have been categorised by the same criterion (Figure 2). Population reduction, on the other hand, is the main criterion for threat categorisation in endemic taxa (53%) and non-endemic taxa (65%).

Distribution

As per IUCN guidelines for Restricted Distribution (see definitions for Taxon Data Sheets end of this report) a taxon is assessed as threatened if it has a restricted distribution. To meet this criterion the taxa also has to qualify two of the three subcriteria (see IUCN categories chart end of this report). Restricted distribution as per IUCN is less than 20,000 sq.km. for the Range of distribution and / or less than 2,000 sq.km. for the Area of occupancy of the

taxon. Of the 64 taxa assessed in this workshop. 25 have a restricted distribution for either the range of distribution or area of occupancy. These are mostly endemic taxa.

Fig. 2. Criteria used in assessing IUCN categories for medicinal plants in Camp III, 1997, Bangalore



Population Reduction

Population reduction is not easy to estimate since it involves estimation of loss of habitat and various threats affecting the population. Information from direct observation is the best source. In many cases there are no population monitoring studies and precise figures are difficult to derive. Therefore educated estimates with good reasoning is also encouraged to derive this information (See IUCN guidelines under section Data Quality). For threatened categories, the minimum percent decline in population is 20% over 3 generations or 10 years whichever is longer. Depending on the rate of decline, the taxon is assigned a threat category (see IUCN categories chart end of this report).

In the present workshop, it is seen that 33 taxa are categorised as threatened based on Population Reduction criterion (Figure 2). Thus, it is evident from this that either loss of habitat or other threats are affecting wild populations of medicinal plants in southern India. In some cases there is a direct observation of population trends. In general, field researchers feel that there is a decrease of about 20% natural habitat in the Western Ghats in the last ten years. Educated guesstimates have also been employed in extrapolating population decline over the years or generations. Population trends have also been based on the habit of the plant; accordingly most of the trees are assessed by their generation length, and the herbs and shrubs by the number of years.

Table 2. Basis of criteria for assessing selected species of southern Indian medicinal plants according to the New IUCN categories (CAMP III) * (assessed for southern Indian region in case of non-endemics)

Taxon	**Endemic**	**IUCN**	**Criteria**	Subcriteria
Semecarpus travancorica	southern Western Ghats	Vulnerable	Pop. reduction	A1c
			Ext. occurence	B1,2c
Uvaria hookeri	southern Western Ghats	Data Deficient	Not applicable	Not applicable
Heracleum candolleanum	Peninsular India	Vulnerable	Pop, reduction	A1a, 1c, "Id
			Ext. occurence	B1,2c
Heracleum rigens	Non endemic	Vulnerable (R)	Ext. occurence	B1.2c
Chonemorpha fragrans	Non endemic	Endangered (R)	Pop. reduction	A1a,1c
Amorphophallus commutatus	Western Ghats	Vulnerable	Pop. reduction	A1a,1c
Raphidophora pertusa	Non endemic	Vulnerable (R)	Pop. reduction	A1a, 1c. 1d
Gymnema khandaiense	Western Ghats	Endangered	Ext. occurence	B1,2c, 2d
Gymnema montanum	Western Ghats	Endangered	Ext. occurence	B1, 2c
Canarium strictum	Non endemic	Vulnerable (R)	Pop. reduction	A1a, 1c, 1d
			Ext. occurence	B1,2c
Humboldtia vahliana	southern Western Ghats	Endangered	Ext. occurence	B1,2c
Cleome burmanni	Not known	Data Deficient	Not applicable	Not applicable
Celastrus paniculatus ssp. *paniculatus*	Non endemic ...	Vulnerable	Pop. reduction	A1a, 1c, 1d
Terminalia arjuna	Non endemic	Lower Risk near threatened (R)	Not applicable	Not applicable
Calophyllum apetalum	Western Ghats	Vulnerable	Pop. reduction	A1a, 1c, 1d
			Ext. occurence	B1,2c, 2e
Garcinia gummi-gutta	Western Ghats	Lower Risk near threatened	Not applicable	Not applicable
Garcinia rubro-echinata	southern Western Ghats	Endangered	Ext. occurence	B1,2c
Garcinia talbotir	Western Ghats	Vulnerable	Ext. occurence	B1,2c
Garcinia travancorica	southern Western Ghats	Endangered	Pop. reduction	A1a,1c
			Ext. occurence	B1,2c
			Pop. estimates	C2a
			Mature individuals	D

Taxon	**Endemic**	**IUCN**	Criteria	**Subcriteria**
Luffa umbellata	southern Western Ghats	Data Deficient	Not applicable	**Not** applicable
Trichosanthes anamalayana	southern Western Ghats	Critically Endangered	Ext. occurence	B1,2c
Trichosanthes cucumenna	Non endemic	Data Deficient (R)	Not applicable	Not applicable
Dipterocarpus indicus	central & southern Western Ghats	Endangered	Pop. reduction	A1a, 1c, "Id
Shore a tumbuggaia	southern Eastern Ghats	Critically Endangered	Pop. reduction	A1c
			Ext. occurence	B1,2c
Diospyros candolleana	Western Ghats	Vulnerable	Pop. reduction	A1a, 1c
Diospyros paniculata	western peninsular India	Vulnerable	Pop. reduction	A1a, 1c, 1d
Elaeocarpus serratus	Non endemic	Lower Risk near threatened (R)	Not applicable	Not applicable
Baliospermum montanum	Non endemic	Endangered (R)	Ext. occurence	B1.2c, 2d,2e
Dalbergia horrida	Peninsular India	Vulnerable	Pop. reduction	A1a,1c
Hydnocarpus alpina	Non endemic	Endangered (R)	Pop. reduction	A1a, 1c, 1d
Hydnocarpus pentandra	Western Ghats	Vulnerable	Pop. reduction	A1a, 1c, 1d
Swertia coymbosa	Western Ghats	Vulnerable	Pop. reduction	A1a, 1c, 1d
			Ext. occurence	B1,2c
Swertia lawii	Western Ghats	Endangered	Ext. occurence	B1,2c
Salacia oblonga	Non endemic	Endangered (R)	Ext. occurence	B1,2c
Salacia reticulata	Non endemic	Endangered (R)	Pop. reduction	A1c, 1d
Plectranthus nilgherricus	southern Western ghats	Endangered	Ext. occurence	B1,2c
Cinnamomum malabatrum	Peninsular India	Vulnerable	Pop. reduction	A1a, 1d
Cinnamomum sulphuratum	Western Ghats	Vulnerable	Pop. reduction	A1a, 1c, 1d ,
Cinnamomum wightii	Non endemic	Endangered (R)	Ext. occurence	B1,2c
Persea macrantha	Non endemic	Vulnerable (R)	Pop. reduction	A1a, 1c, 1d
Smilax zeylanica	Non endemic	Lower Risk near theatened	Not applicable	Not applicable
Strychnos aenea	southern Western Ghats	Endangered	Pop. reduction	A1a, 1c, 1d
			Ext. occurence	B1,2c
Michelia nilagirica	Non endemic	Vulnerable (R)	Pop. reduction	A1a, 1c

Taxon	Endemic	IUCN	Criteria	Subcriteria
Aphanamixis polystachya	Non endemic	Vulnerable (R)	Pop. reduction	A1a, 1c. Id
Dysoxylum jvalabahcum	central & southern Western Ghats	Endangered	Pop. reduction	A1a, 1c, 1d, 1e
Artocarpus hirsutus	Western Ghats and West coast	Vulnerable	Pop. reduction	A1a, 1c, 1d
Knema attenuata	Western Ghats	Lower Risk near threatened	Not applicable	Not applicable
Myhstica dactyloides	Non endemic	Vulnerable (R)	Pop. reduction	A1a, 1c, 1d
Embellia tsjeriam-cottam	Non endemic	Endangered (R)	Ext. occurence	B1.2c
Helminthostachys zeylanicus	Non endemic	Endangered (R)	Ext. occurence	B1,2c
Dendrobium ovatum	Western Ghats	Vulnerable	Pop. reduction	A1a, 1c
Eulophia cullenii	southern Western Ghats	Critically Endangered	Ext. occurence	B1,2c, 2e
Eulophia ramentacea	Peninsular India	Critically Endangered	Ext. occurence	B1,2c
Decalepis hamiltonii	Peninsular India	Endangered	Ext. occurence	B1,2c, 2e
Santaium album	Non endemic	Endangered (R)	Pop. reduction	A1a, 1c, 1d, 1e
Sapindus laurifolia	Non endemic	Lower Risk near threatened (R)	Not applicable	Not applicable
Madhuca longifolia var. *longifolia*	Non endemic	Endangered (R)	Pop. reduction	A1a, 1c, 1d
Madhuca neriifolia	Non endemic	Vulnerable (R)	Pop. reduction	Ale
Pterospermum xylocarpum	Non endemic	Lower Risk near threatened (R)	Not applicable	Not applicable
Valeriana leshenaultii	southern Western Ghats	Critically Endangered	Pop. reduction	A1a,1c
Vitex trifolia	Non endemic	Lower Risk near threatened (R)	Not applicable	Not applicable
Alpinia galanga	Non endemic	Data Deficient (R)	Not applicable	Not applicable
Curcuma pseudomontana	Western Ghats	Vulnerable	Pop. reduction	A1a, 1d
Curcuma zedoaria	Non endemic	Lower Risk near threatened (R)	Not applicable	Not applicable

Threats

Threats include Loss of habitat, Loss of habitat due to fragmentation. Loss of habitat due to exotic plants, Harvest, Harvest for food. Harvest for medicine, Harvest for timber, Over-exploitation, Human interference. Disease. Predation, Landslide and Trade (Tables 3 & 4).

Threats affecting habitat such as fragmentation, predation and grazing, introduction of exotic

plants or monocultures and plantations, and in one case landslides are the main contributing factors. All these along with factors that affect population numbers (human interference, disease, overexploitation. harvesting for various purposes and trade) are due to man's ever growing needs. Ten of the 64 taxa assessed are found in 5 (or less) severely fragmented locations. All of these taxa are also highly restricted in their distribution making them either Critically Endangered or Endangered. A catastrophe or random factor could very well eliminate any of them from their limited locations.

Table 3. Threats affecting medicinal plant taxa in southern India

	Threats affecting habitat						Threats affecting population						
	L	Lf	Lp	Ls	P	D	1	Ov	H	Hm	Ht	Hf	T
CR-	4	1	0	0	1	0	3	0	0	3	0	0 -	2
EN	11	7	3	1	3	1	2	8	0	17	4	1	16
VU	17	5	1	0	3	0	2	4	0	17	3	2	19
LR	5	0	0	0	0	0	0	0	3	5	1	1	8
DD	0	0	0	0	0	0	0	0	0	0	0	0	1

Tables 3 & 4 for threats show that the biggest single threat to medicinal plants is trade (25%) followed by harvest for medicine (23%) and loss of habitat (20%). The rest of the threats together contribute to the remaining 32%.

Trade

Unsustainable harvest is one of the major threats to medicinal plants in India and elsewhere. It is definitely true of many of the taxa assessed here. Seventy-one percent of all the assessed taxa and 74% of threatened taxa are in trade. Many of the taxa that are not in trade are being harvested unsustainably for subsistence living. Given the rapid rate of decline due to other factors, it is clear that this harvest is posing a threat. These taxa face a similar danger like those that are in trade since a host of other man-made factors have resulted in the taxa moving towards extinction.

Forty-six taxa are assessed to be in trade (Table 4). Depending on the scope and quantity of trade, four levels such as local trade, domestic trade, commercial trade and international trade are listed. While some of the taxa are being traded at one level only, many are being traded at two or more levels. Most of the trade is either at commercial (43.5%) or domestic levels (34%) while local and international trade are comparatively minimal (16.5% and 6% respectively) (Table 5).

Thirty seven of the threatened taxa are categorised to be in trade (Table 4). Trade along with other factors is a threat to the survivability of the taxon in the wild. Figure 3 indicates different levels of trade of threatened and non-threatened taxa. For both threatened and non-threatened taxa domestic (34% and 37.5% repectively) and commercial (41% and 50% respectively) trades dominate.

Table 4. Threat and trade information for selected species of southern Indian medicinal plants assessed according to the New IUCN categories (assessed for southern Indian region in case of non endemics)

Taxon	Endemic	Threat	Trade	IUCN Category
Semecarpus travancorica	southern Western Ghats	Loss of habitat	Not known	Vulnerable
Uvaria hookeri	southern Western Ghats	Not known	Not known	Data Deficient
Heracleum candolleanum	Peninsular India	Loss of habitat, Harvest for medicine, Trade	. Commercial	Vulnerable
Heracleum rigens	Non endemic	Trade of parts	Local	Vulnerable (R)
Chonemorpha fragrans	Non endemic	Loss of habitat, Harvest for medicine	Not known	Endangered (R)
Amorphophallus commutatus	Western Ghats	Loss of habitat, Harvest for food, Harvest for medicine. Predation, Fragmentation	No	Vulnerable
Raphidophora pertusa	Non endemic	Loss of habitat, Trade of parts	Commercial	Vulnerable (R)
Gymnema khandalense	Western Ghats	Harvest for medicine, Trade	Domestic, Commercial	Endangered
Gymnema montanum	Western Ghats	Overexploitation, Harvest for medicine. Trade of parts	Domestic, Commercial	Endangered
Canahum strictum	Non endemic	Loss of habitat, Overexploitation, Harvest for medicine, Human interference, Trade	Commercial, International	Vulnerable (R)
Humboldtia vahliana	southern Western Ghats	Harvet for medicine, Trade of parts	Domestic	Endangered
Cleome burmanni	Not known	Not known	Not known	Data Deficient (R)
Celastrus paniculatus ssp. *paniculatus*	Non endemic	Loss of habitat, Harvest for medicine, Trade of parts	Commercial	Vulnerable (R)
Terminalia anuria	Non endemic	Harvest for medicine, Trade of parts, Harvest for timber	Domestic, Commercial	Lower Risk near threatened (R)
Calophyllum apetalum	Western Ghats	Loss of habitat, Harvest for medicine, Harvest for timber, Trade	Domestic, Commercial	Vulnerable
Garcinia gummi-gutta	Western Ghats	Loss of habitat, Harvest for food, Harvest for medicine, Trade	Commercial	Lower Risk near threatened

Taxon	Endemic	Threat	Trade	IUCN Category
Garcinia rubro-echinata	southern Western Ghats	Fragmentation, Trade of parts	Local, Domestic, Commercial	Endangered
Garcinia talbotir	Western Ghats	Loss of habitat, Harvest for food, Trade	Local, Domestic	Vulnerable
Garcinia travancorica	southern Western Ghats	Human interference, Harvest for medicine, Trade	Local	Endangered
Luff a umbellate	southern Western Ghats	Not known	Not known	Data Deficient
Trichosanthes anamalayana	southern Western Ghats	Human interference, Harvest for medicine, Trade	Domestic, Commercial	Critically Endangered
Trichosanthes cucumerina	Non endemic	Not known	Not known	Data Deficient (R)
Dipterocarpus indicus	central & southern Western Ghats	Loss of habitat, Harvest for timber, Trade	Domestic, Commercial	Endangered
Shorea tumbuggaia	southern Eastern Ghats	Loss of habitat, Fragmentation, Harvest for medicine	Not known	Critically Endangered
Diospyros candolleana	Western Ghats	Loss of habitat, Harvest for medicine, Trade	Local	Vulnerable
Diospyros paniculate	western peninsular India	Fragmentation, Exotic plants, Harvest for medicine, Trade	Local	Vulnerable
Elaeocarpus serretus	Non endemic	Los of habitat, Harvest	Not known	Lower Risk near threatened (R)
Beliospermum montanum	Non endemic	Overexploitation, Fragmentation, Harvest for medicine, Trade	Domestic, Commercial	Endangered (R)
Delbergie horrida	Peninsular India	Loss of habitat. Harvest for medicine	No	Vulnerable
Hydnocarpus alpina	Non endemic	Loss of habitat, Fragmentation, Overexploitation, Harvest for medicine, Trade of parts	Commercial	Endangered (R)
Hydnocarpus pentandra	Western Ghats	Fragmentation, Overexploitation, Predation, Harvest for medicine, Trade	Commercial	Vulnerable
Swertie coymbose	Western Ghats	Loss of habitat, Fragmentation, Harvest for medicine, Predation, Trade	Domestic, Commercial	Vulnerable

Taxon	Endemic	Threat	Trade	IUCN Category
Swertia lawii	Western Ghats	Loss of habitat, Exotic plants, Predation	Not known	Endangered
Sa/ac/a *oblonga*	Non endemic	Loss of habitat, Harvest or medicine	Not known	Endangered (R)
Saiacia reticulata	Non endemic	Loss of habitat, Harvest for medicine, Trade of parts	Commercial	Endangered (R)
Plectranthus nilgherricus	southern Western ghats	Loss of habitat. Fragmentation	Not known	Endangered
Cinnamomum malabatrum	Peninsular India	Harvest for medicine, Trade of parts	Domestic, Commerciaf, International	Vulnerable
Cinnamomum sulphuratum	Western Ghats	Loss of habitat, Harvest for medicine, Trade of parts	Domestic, Commercial, International	Vulnerable
Cinnamomum wightii	Non endemic	Fragmentation, Harvest for medicine, Trade	Local, Domestic, Commercial	Endangered (R)
Persea macrantha	Non endemic	Harvest for medicine, Harvest for timber, Trade	Commercial	Vulnerable (R)
Smilax zeylanic'a	Non endemic	Loss of habitat, Harvest for medicine, Trade of parts	Domestic, Commercial	Lower Risk near threatened (R)
Strychnos aenea	southern Western Ghats	Loss of habitat. Overexploitation, Harvest for medicine	Not known	Endangered
Michelia niagirica	Non endemic	Loss of habitat	No	Vulnerable (R)
Aphanamixis polystachya	Non endemic	Loss of habitat, Harvest for medicine, -. Trade of parts	Domestic, Commercial	Vulnerable (R)
Dysoxylum malabaricum	central & southern Western Ghats	Loss of habitat, Fragmentation, Overexploitation, Exotic plants, Harvest for timber, Harvest for medicine, Trade	Domestic, Commercial	Endangered
Artocarpus hirsutus	Western Ghats and West coast	Loss of habitat, Harvest for timber, Trade	Local, Domestic, Commercial	Vulnerable
Knema attenuata	Western Ghats	Loss of habitat, Harvest, Trade	Domestic, Commercial	Lower Risk near threatened
Myristica dactyloides	Non endemic	Overexploitation, Harvest for medicine, Trade	Commercial	Vulnerable (R)

Taxon	Endemic	Threat	Trade	IUCN Category
Embellia tsjeriam-cottam	Non endemic	Fragmentation, Landslides, Trade, Harvest for medicine	Local, Domestic, Commercial	Endangered (R)
Helminthostachys zeylanicus	Non endemic	Human interference, Harvest for food, Harvest for medicine, Trade of parts	Local, Domestic, Commercial	Endangered (R)
Dendrobium ovatum	Western Ghats	Loss of habitat, Human interference, Fragmentation	Not known	Vulnerable
Eulophia cullenii	southern Western Ghats	Loss of habitat, Human interference, Predation, Harvest for medicine. Trade	Local, Domestic	Critically Endangered
Eulophia ramentacea	Peninsular India	Loss of habitat, Human interference	Not known	Critically Endangered
Decalepis hamiltonii	Peninsular India	Loss of habitat, Overexploitation. Predation, Harvest for medicine, Trade of parts	Domestic, Commercial, International	Endangered
Santalum album	Non endemic	Exotic plants, Overexploitation, Harvest for timber. Harvest for medicine, Disease, Trade	Domestic, Commercial, international	Endangered (R)
Sapindus laurifolia	Non endemic	Trade of parts	Domestic, Commercial	Lower Risk near threatened (R)
Madhuca longifolia var. *longifolia*	Non endemic	Loss of habitat, Predation, Overexploitation. Harvest for timber. Harvest or medicine. Trade	Domestic, Commercial	Endangered (R)
Madhuca nehifolia	Non endemic	Loss of habitat, Harvest for medicine, Trade	Local; Domestic	Vulnerable (R)
Pterospermum xylocarpum	Non endemic	Loss of habitat, Harvest, Trade of parts	Local, Domestic	Lower Risk near threatened (R)
Valeriana leshenaultii	southern Western Ghats	Loss of habitat	Not known	Critically Endangered
Vitex trifolia	Non endemic	Harvest for medicine, Trade of parts	Commercial	Lower Risk near threatened (R)
Alpinia galanga	Non endemic	Trade	Commercial	Data Deficient (R)
Curcuma pseudomontana	Western Ghats	Overexploitation, Harvest for medicine, Trade of parts	Commercial	Vulnerable
Curcuma zedoaria	Non endemic	Harvest for medicine, Trade of parts	Local, Domestic, Commercial	Lower Risk near threatened (R)

Table 5. Types of trade in southern Indian medicinal plants assessed

	CR	EN	VU	LR	DD
Local	**1**	5	6	2	0
Domestic	2	13	8	6	0
Commercial	**1**	14	13	8	2
International	0	2	3	0	0

Trade has been a contentious issue for the last many years and has assumed greater importance in the recent years due to factors that compromise the biodiversity convention, indigenous peoples rights, and foreign trade. The most recent "scare" is patents which have aroused much suspicion and frustration among the Indian scientific and political community towards countries that threaten local community rights in India. A factor of threat to the populations of medicinal plants in the wild has been the basis for the Government of India's policy of a "Negative list of Exports" of plants in trade. This list is now being amended, as is explained in more detail in the introduction, based on the CAMP workshops in which species are addressed from a conservation point of view.

Research Management

Research recommendations for most of the taxa are made based on the amount of information available and the need for understanding and managing the taxa in the wild. It is seen that in total 145 research recommendations (not including PHVA) have been made for all taxa. Recommendations are:

a) Survey (S)
b) Monitoring (M)
c) Taxonomic and morphological genetic studies (T)
d) Genetic management (G)
e) Habitat management (Hm)
f) Limiting factor research (Lr)
g) Limiting factor management (Lm)
h) Life history studies (Lh) and
i) Other taxon specific recommendations (O)

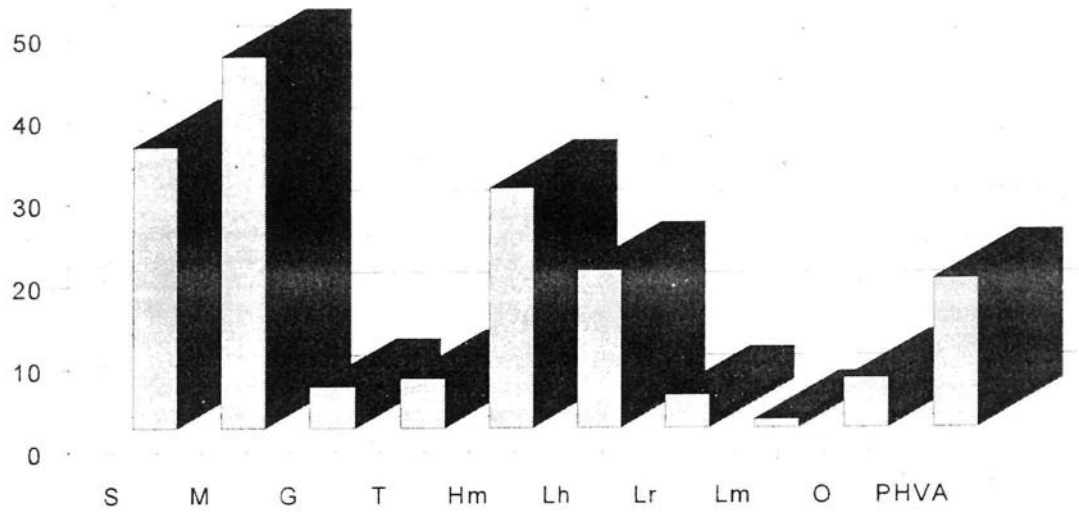
Figure 4 shows that Monitoring is recommended for thirty per cent of taxa followed by Survey at 23%, Habitat management at 18%, Life history studies at 14%, Taxonomic and other taxon specific recommendations at 4% (each), Genetic management at 3%, Limiting factor research at 3% and Limiting factor management at 0.5%.

No monitoring has been carried out in any of the areas to determine population trends or effects of harvest and other human-influenced changes in the environment. Life history studies are recommended to understand the biology and thereby the life cycle and growth patterns in the wild as well as in cultivation.

Recommendations for the assessed taxa include those described above and also including Population and Habitat Viability Assessment and Cultivation. Fifty-eight percent of all the taxa assessed are recommended for cultivation and 97% of all the threatened taxa are

recommended for cultivation. Population and Habitat Viability Assessment (see definitions end of this report) is recommended for 51% of threatened taxa and 30% of remaining taxa.

Fig. 4. Research recommendations



Cultivation and difficulty

Cultivation recommendations are at three levels, Levels 1, 2 and 3 (see definitions at end of report). Level 1 is for taxa to be interactively managed *in situ* and *ex situ* so as to retain 90% genetic diversity for 100 years. Level 2 is for *ex situ* populations to be infused with fresh genetic material from the wild so as to retain sufficient diversity. Level 3 is not for conservation but only for education, husbandry and research.

In this workshop, a cultivation programme for many of the threatened taxa is recommended, although for most of the taxa techniques for cultivation are not in place. Level of difficulty of cultivating the taxa is given in the Summary Data Lable and a Table (6) comparing the categories and level of difficulty is given hereunder.

Medicinal plants are being overexploited from the wild for medicinal trade. Populations have shrunk to the extent that any harvest even for subsistence living could result in the plant going extinct. It is therefore suggested that cultivation be taken up to meet all of the demands of the trade industry or local needs for subsistence. Cultivation is a must for there is no alternative if the taxa is to survive in the wild. Any delay would only mean that a much less wild genetic diversity will be available to utilise for cultivation and recovery programmes.

Cultivation in most cases is not known for there have been no trials conducted. In cases where trials have been made to cultivate threatened taxa, it is not so difficult as pharmaceutical companies claim! There are many institutions that have taken up cultivation of some of the threatened taxa. Coimbatore Zoological Park, for example is maintaining over 200 Western Ghats plants in their nursery. Although virtual novices, they have been succesful in propagating some allegedly difficult plants. Also much information on cultivation of rare taxa can be obtained from FRLHT's publication "GeneNet".

Table 6. Difficulty in cultivation of the medicinal plants taxa assessed

IUCN categories	Level of difficulty			
	Least difficult	Mod'ly difficult	Very difficult	Not known
Critically Endangered	1	0	0	4
Endangered	2	2	3	13
Vulnerable	5	3	3	13
Lower Risk	3	0	0	4
Data Deficient	1	0	0	7

Data Quality

Assessments cannot be relied upon if there is no proper methodology or facts. It is therefore important to provide an authenticated account with the results. Data Quality are of five types, viz.

a) Reliable census or monitoring
b) General field study
c) Informal field sighting
d) Indirect information (from trade, popular belief, etc)
e) Herbarium/ museum/ literature/ collection records

Data quality for all threatened taxa in this workshop is either by or a combination of Reliable census and monitoring (6%). General field study (76%), Informal field sighting (6%) or by Indirect information (11%) (Table 7). Data quality for all the 64 taxa including non-threatened and Data Deficient categories also follows the same pattern.

The IUCN guidelines for assessment suggests that "…..the absence of high quality data should not deter attempts at applying the criteria, as methods involving estimation, inference and projection are emphasised to be acceptable throughout. Inference and projection may be based on extrapolation of current or potential threats into the future (including dependence on other taxa), so factors related to population abundance or distribution (including dependence on other taxa), so long as these can reasonably be supported. Suspected or inferred patterns in either the recent past, present or near future can be based on any of a series of related factors, and these factors should be specified.

Taxa at risk from threats posed by future events of low probability but with severe

consequences (catastrophes) Should be identified by the criteria (e.g. small distribution, few locations). Some threats need to be identified particularly early, and appropriate actions taken, because their effects are irreversible, or nearly so (pathogens, invasive organisms, hybridization).”

Table 7. Data Quality index for taxa evaluation

IUCN categories	Data Quality			
	1	2	3	4
Critically Endangered	1	5	0	2
Endangered	2	19	1	3
Vulnerable	1	23	3	2
Lower Risk	0	7	1	0
Data Deficient	0	5	0	0

The CAMP exercise has helped in understanding the urgent need to protect threatened taxa from extinction and manage them in the near future. Some of these taxa may not survive if timely action is not taken, that is if they are not intensively managed. Many of them, because of their small population size and" restricted distribution, require intensive care and habitat management and may survive only with human support.

Taxon Data Sheet Definitions

The Conservation Assessment and Management Plan (CAMP) taxon data sheet is a working document that provides information that can be used to assess the degree of threat and recommend conservation action. The first part of the sheet summarises information on the status of the wild and captive populations of each taxon. It contains taxonomic, distributional, and demographic information useful in determining which taxa are under greatest threat of extinction. This information can be used to identify priorities for intensive management action for taxa.

This Sample Taxon Data Sheet model is based on birds, but is similar to those for other taxa.

Scientific name: Scientific names of extant taxa; genus and species (or subspecies where appropriate).

Taxonomic status : This indicates the taxonomic status of the extant taxa. Taxonomic uncertainties may be discussed in this section. Subspecies not considered separately should be listed here along with their distribution.

Original Global distribution: List the distribution of the species in its entire range

Current Regional Distribution:

List the geographical extent, for which the assessment is made (e.g. "southern India" for a taxon with a wider distribution for which assessment is made only for the southern Indian region.)

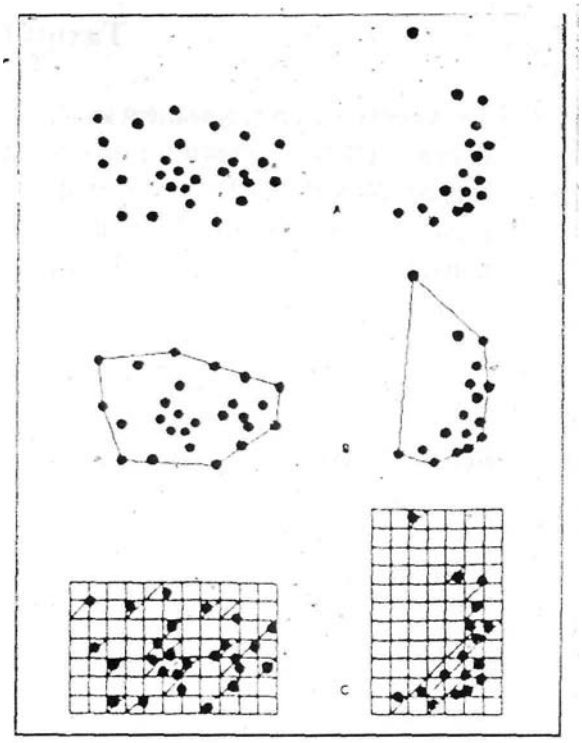
Extent of occurence: List the actual size of the area in which the species occurs, if pos sible. Also list the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred, or projected sites of present occurrence of a taxon, excluding cases of vagrancy (Figure 1). This measure does not take account of discontinuities or disjunctions in the spatial distributions of taxa. Extent of occurrence can often be measured by a minimum convex polygon (the smallest polygon in which no internal angle exceeds 180 degrees and which contains all the sites of occurrence).

A $< 100\ km^2$
B: $101\ km^2$-$5{,}000\ km^2$
C: $5{,}001\ km^2$-$20{,}000\ km^2$
D: $> 20{,}00l\ km^2$

Area of occupancy : List the area within the 'extent of occurrence' which is actually occupied by a taxon, excluding cases of vagrancy. The measure reflects the fact that a taxon will not usually occur throughout the area of its extent of occurrence, which may, for example, contain unsuitable habitats. The area of occupancy is the smallest area

essential at any stage to the survival of a taxon (e.g., colonial nesting sites, feeding sites for migratory taxa). The size of the area of occupancy will be a function of the scale at which it is measured, and should be at a scale appropriate to relevant biological aspects of the taxon. The criteria include values in km^2 and thus to avoid errors in classification the area of occupancy should be measured on grid squares or equivalents which are sufficiently small (see Figure I).

A: $<10km^2$
B: 11 km^2-500 km^2
C: 501 km^2- 2,000 km^2
D: > 2,001 km^2



Two examples of the distinction between the extent of occurance and the area of occupancy, (a) and (b) are the spatial distribution of known, inferred, or projected sites of occurence, (c) and (d) show one possible boundary to the extent of occurence, which is the measured area within this boundary, (e) and (f) show one measure of area of occupancy which can be measured by the sum of the occupied grid squares.

 # Locations: Note the number of locations. If it is fragmented, indicate "F" after the number of locations.

Population trends - % change in years or in generations:
If possible, list the trend of the population (stable, declining, or increasing). If possible, list the percent of change over a particular time frame (e.g.. 10 or 20 years) or number of generations. Specify the number of years or generations over which the decline has occurred, e.g., 10%/ 2gen. or 20%/ 20 yrs.

Generation time : Indicate the number of years in a generation. A generation is defined as the average age of parents in the population.

Global population : List the estimated numbers in the wild. If specific numbers are unavailable, estimate the general range of the population size.

Regional populations: List the esimated number in any particular region for which there are data, followed by the location.

Data Quality : List the actual age of the data used to provide the 'population estimate'. Also list the type of data from which the estimates are provided.

1= Reliable census or population monitoring
2= General field study
3= Informal field sightings
4= Indirect information (trade numbers, habitat availability)
5 = Herbarium/ museum/ literature/ collections/ records

Any combination of above different data quality in parts of range.

Recent field studies: List any current or recent field studies, the name of the researcher - and the location of the study.

Threats : List immediate or predicted events that are or may cause significant population declines. These may include:

A = Aircraft.
C = Climate
D = Disease
Dp = Decline in prey species
Dr = Drowning
E= Edaphic factors (change due to fertilisers, fire, etc.)
F = Fishing
G = Genetic problems
Gr= Grazing
H = Hunting / Harvest
Hf = Hunting or Harvest for food
Hm = Hunting or Harvest for medicine
Ht = Hunting for trophies or Harvest for timber
Hyb= Hybridization
I = Human interference, persecution, or disturbance
Ic = Interspecific competition
Ice = Interspecific competition from exotics
Il = Interspecific competition with domestic livestock
L = Loss of habitat
La = Loss of habitat because of exotic animals
Lf = Loss of habitat because of fragmentation
Lp = Loss of habitat because of exotic plants
Ls = Landslides
M = Marine perturbations, including El Nino and other shifts
N = Nutritional disorders or problems
Ov = Overexploitation
P = Predation
Pe = Predation by exotics
Ps= Pesticides
Pl = Powerlines
Po= Poisoning
Pu = Pollution
S = Catastrophic events
Sd: drought
Sf: fire
Sh: hurricane

St: tsunami
Sv: volcano
T = Trade for the live animal market or medicine
Tp = Trade for parts, including skins, bone, bark, fruits, etc.
Tr = Trampling
W = War

Trade: Was the species present in Trade according to CITES records? If so, list year(s). or list trade practices and parts.
L = Local trade
D= Domestic trade
C = Commercial trade
I = International trade

Comments: Note any additional information that is important with respect to the - conservation of the species.

IUCN: Status according to the New IUCN Red List criteria

EX = Extinct
EW = Extinct in the wild
CR = Critically Endangered
EN = Endangered
VU = Vulnerable
LR = Lower Risk
nt= near threatened
cd = conservation dependent
lc = least concern
DD= Data Deficient
NE = Not Evaluated

Criteria based on: Indicate which of the New IUCN Red List criteria were used to assign a category of threat:

PR= Population reduction (Ala, or A2b, etc.)
EO = Extent of occurrence (B1, or B2a, B3c, etc.)
PE = Population estimates (CI. or C2a, etc.)
NM = Number of mature individuals (D)
PX = Probability of extinction (E)

CITES: List CITES Appendix on which the species is listed, if appropriate.

IWPA (72,91): Indian Wildlife (Protection) Act, 1972; Amendments Act, 1991

Other: List whether the species has been assigned threatened status in other venues, e.g., nationally or in other conservation assessments.

Recommendations

Research management: It should be noted that there is (or should be) a clear relationship between threats and subsequent outlined research management actions. The "Research Management" column provides an integrated view of actions to be taken, based on the listed threats. Research management can be defined as a management program which includes a strong feedback between management activities and an evaluation of the efficacy of the management, as well as response of the species to that activity. The categories within the column are as follows:

T= Taxonomic and morphological genetic studies
Tl = Translocations
S = Survey - search and find
M = Monitoring - to determine population information
H = Husbandry research
G = Genetic management
Hm = Habitat management - management actions primarily intended to protect and/or enhance the species' habitat (e.g., forest management)
Lm = Limiting factor management -"research management" activities on known or suspected limiting factors. Management projects have a research component that provide sci entifically defensible results.
Lr = Limiting factor research - research projects aimed at determining limiting factors. Results from this work may provide management recommendations and future research needs
Lh = Life history studies
O = Other (record in detail on taxon data sheet)

PHVA: Is a Population and Habitat Viability Assessment process recommended to develop an intensive management/recovery plan for the species? Yes, No or Pending further data from surveys or other research.

NOTE **A detailed model of a species' biology is not always needed to make sound management decisions.

CULTIVATION OR CAPTIVE PROGRAM RECOMMENDATIONS:

1 = Level 1 - A captive or cultivation population is recommended as a component of a conservation program. This program has a tentative goal of developing and managing a population sufficient to preserve 90% of the genetic diversity of a population for 100 years (90%/100). The program should be further defined with a species manage ment plan encompassing the wild and captive/cultivation populations and implemented immediately with available stock in captivity/cultivation. If the current stock is insufficient to meet program goals.

a species management plan should be developed to specify the need for additional founder stock. If no stock is present in captivity/ cultivation then the program should be developed collaboratively with appropriate wildlife agencies and specialist institutions.

2 = **Level 2** - Similar to the above except a species/subspecies man agement plan would include periodic reinforcement of captive/ cultivated population with new genetic material from the wild. The levels and amount of genetic exchange needed should be defined in terms of the program goals, a population model, and species man agement plan. It is anticipated that periodic supplementation with new genetic material will allow management of a smaller captive/ - cultivated population. The time period for implementation of a Level 2 program will depend on recommendations made at the CAMP.

3 = **Level 3** - A captive or cultivation programme is not currently recommended as a demographic or genetic contribution to the conservation of the species/subspecies but is recommended for education, research, or husbandry.

N = **No** - A captive or cultivation programme is not currently recom mended as a demographic or genetic contribution to the conserva tion of the species/subspecies. Taxa already held in captivity or cultivation may be included in this category. In this case species/ subspecies should be evaluated either for management toward a decrease in numbers or for complete elimination from captive or cultivation programs as part of a strategy to accommodate as many species/ subspecies as possible of higher conservation priority as identified in the CAMP or in SSC Action Plans.

P = **Pending** - A decision on a captive or cultivation programme will depend upon further data either from a PHVA, a survey, or existing identified sources to be queried.

Level of difficulty : What is the level of difficulty in maintaining the species in captive. or cultivation conditions

1 = **Least difficult** - Techniques are in place for capture or collection maintenance, and propagation of similar taxa in captivity or cultiva- tion which ostensibly could be applied to the taxon.

2 = **Moderate difficulty** - Techniques are only partially in place for capture or collection maintenance and propagation of similar taxa in captivity or cultivation, and many techniques still need refinement.

3 = **Very difficult** - Techniques are not in place for capture or collec tion, maintenance, and propagation of similar taxa in captivity or

cultivation and techniques still need to be developed.

Existing Captive/ Cultivation Population :
Number of individuals in captivity or cultivation according to the International Species Information System, Central Zoo Authority of India, or similar botanical listing. Please add other information, when available, as the numbers listed consist of only a portion of the captive or cultivated population.

Sources : List sources used for information for the above data. (Author's name, year, title of article or book, journal, issue, and page numbers).

Compilers : List the names of the people who contributed information for this taxon data sheet.

Appendix I

Taxon Data Sheets

TAXON DATA SHEET

DD-R

Species (& synonyms):	***Alpinia galanga Sw.*** **= *A. rheedii* Wight**
Family:	Zingiberaceae
Taxonomic status:	Species
Habit:	Perennial herb
Habitat:	Evergreen forests along streams and deciduous forests
Original Global Distribution:	From Himalaya to Peninsular India and Andaman Nicobar.
Current Regional Distribution:	Southern India
- Elevation:	Not known
- Range (km^2):	Not known
- Area Occupied (km^2):	Not known
- Number of locations:	Not known
Population Trends - % change	
- % Decline:	Not known
- Time / Rate (Yrs or gens):	Not known
- No. of Mature Individuals:	Not known
Global Population:	Not known
Regional Population:	Not known
Data Quality:	Indirect information
Recent Field Studies:	None
Threats:	Trade
Trade:	Commercial
Other Comments:	No recent records of collection from wild. Mid 80s collection in Kerala by M. Sivadasan. Often found as an escapee (K.G. Bhat, 1993)
Status	
-IUCN:	DATA DEFICIENT (Regionally); DATA DEFICIENT (Globally)
- Criteria based on:	Not applicable
-CITES:	No
-IWPA(1972;91):	No
Research Recommendations	
- Research management:	Survey
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	Cultivated throughout Kerala and Coorg, Karnataka
- Level of difficulty:	Least difficult
Existing Cultivations:	Large scales in Kerala and Karnataka, often grown in gardens
- Names of facilities:	TBGRI
Sources:	Personal observation/ comment: M. Sivadasan Bhat, K.G., (1993). Studies of Indian Zingibraceae of Karnataka. *Higher Plants of Indian Subcontinent* Vol. 4: 48 (Additional series of *Indian J. Forestry* No. 7) Sharma, B.D., *et al*. *Flora of Karnataka,* BSI
Compilers:	Dr. P. Venu, Mr. P.S. Udayan, Ms. Noorunissa Begum, Mr. D.K. Ved, Mr. A.E. Shanawaz Khan, Dr. S.P. Subramani, Ms. Caroline Priya, Dr. C.G. Kushalappa

TAXON DATA SHEET

VU

Species (& synonyms):	***Amorphophallus commutatus* (Schott) Engl.** = ***Conophallus commutatus* Schott**
Family:	Araceae
Taxonomic status:	Species
Habit:	Cormus herb
Habitat:	In open, forest fringes. Moist decidous to semi-evergreen
Original Global Distribution:	ENDEMIC to Western Ghats
Current Regional Distribution:	Western Ghats in Kamataka, Kerala, Gujarat, Goa and Maharashtra
- Elevation:	50 - 600 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	> 2,000
- Number of locations:	Many scattered
Population Trends - % change	
- % Decline:	20%
- Time / Rate (Yrs or gens):	10 years
- No. of Mature Individuals:	Not known
Global Population:	Declining gradually
Data Quality:	General field studies; Informal field sightings (For Kerala there are published reports. Karnataka - personal collections)
Recent Field Studies:	M. Sivadasan, 1975-96 in Kerala; B.V. Shetty, 1995 in Karnataka
Threats:	Loss of habitat; Harvest for food; Harvest for medicine; Predation by wild boars; Loss of habitat because of fragmentation
Trade:	No
Other Comments:	Collected in Karnataka by M. Sivadasan (near Kemmangudi) in July 1991; Collected in Goa 1994 -95 and from Vythiri (Wyanad), Mukkali (Palakkad) in Kerala (Udipi by B.V. Shetty). Peduncle & Inflorecense are edible - S.K. Jain Ethnobotany Population of +/- 20-25 individuals in 100 sq. m. area; Scattered. Occasionally used by tribals/ rural communities.
Status	
- IUCN:	VULNERABLE
- Criteria based on:	Population reduction (A1a, 1c)
- -CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Life history studies; Survey; Monitoring; Habitat management
-P.H.V.A.:	Pending results
Cultivation Program Recommendations	
- Cultivation:	No
- Level of difficulty:	Least difficult
Existing Cultivations:	
- Names of facilities:	Sample individuals grown at Dept. of Botany, Calicut Univeristy and Arboretum of Mangalore University. Live collections mainatained in TBGRI from Kemmangundi Hills
Sources:	Personal observation: M. Sivadasan, B.V. Shetty Jain, S.K. *Ethnobotany*
Compilers:	Dr. V. Chelladurai, Dr. Keshava Murthy, Mr. G.S. Goraya, Ms. Meera Iyer, Dr. N. Loganathan, Dr. V.S. Ramachandran, Dr. M. Sivadasan

TAXON DATA SHEET

VU-R

Species (& synonyms):	***Aphanamixis polystachya* (Wallich) Parker** **= *Aglaia polystachya* Wallich** **= *Amoora rohituka* (Roxb.) Wight** & **Arn.** **= *Andersonia rohituka* Roxb.**
Family:	Meliaceae
Taxonomic status:	Species
Habit:	Tree
Habitat:	Semi-evergreen to evergreen; (Moist deciduous - V. Chelladurai & K. Ravi Kumar) Important component of middle storey.
Original Global Distribution:	Sri Lanka; Peninsular, East & NE India: SE Asia
Current Regional Distribution:	Uttara & Dakshina Kannada, Hassan, Mysore; Palakkad, Thiruvananthapuram, Idukki, Coimbatore, Nilgiris, Salem, Tiruchchirappalli, Kamarajar, Madurai and Tirunelvelli
-Elevation:	150-700 m.
-Range (km^2):	> 20,000
-Area Occupied (km^2):	< 2,000
-Number of locations:	Many scattered individuals
Population Trends - % change	
-% Decline:	> 20 %
-Time / Rate (Yrs or gens):	10 years
-No, of Mature Individuals:	Not known
Global Population:	Not known
Regional Population:	Declining gradually
Data Quality:	Informal field sightings (V. Chelladurai, 1986); General field studies (A.G. Pandurangan in Idukki, 1985)
Recent Field Studies:	Keshava Murthy, 1996; V.S. Ramachandran, 1996; N. Mohanan, 1994 -95; K. Ravi Kumar, 1984 -92; M.B. Vishwanathan, 1992 -96 in Kolli Hills; S. Armougame, 1996 in Silent Valley; A.E. Shanawaz Khan, 1995 in Chinikala; P.S. Udayan, 1997 m BRT Hills
Threats:	Harvest for medicine; Trade for parts for medicine; Loss of habitat
Trade:	Domestic; Commercial
Other Comments:	Bark used for curing Cancer (CDRI - V.S. Ramachandran). Leaves, seeds and bark used for medicine; Bark is traded for Rs. 80/- per kg (Keshava Murthy). Destructive collection of bark. Bark is traded.
Status	
-IUCN:	VULNERABLE (Regionally) DATA DEFICIENT (Globally)
-Criteria based on:	Population reduction (A1a, 1c, 1d)
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
-Research management:	Life history studies; Survey; Monitoring; Habitat management
-P.H.V.A.:	Pending further data
Cultivation Program Recommendations	
-Cultivation:	Grown in forest departments and in gardens
-Level of difficulty:	Study required. Nothing known
Existing Cultivations:	
-Names of facilities:	Forest Department in Uttara Kannada

Continued next page

Aphanamixis polystachya continued

Sources:	Personal observation/ comments: A.G. Pandurangan, Keshava Murthy, *M.S.* Ramachandran, N. Mohanan, K. Ravi Kumar, M.B. Vishwanathan, S. Armougame, A.E. Shanawaz Khan, P.S. Udayan, V. Chelladurai Saldanha, C.J. (1996). *Flora of Karnataka* 2:231; Nair, N.C. & A.N. Henry (1983). *Flora of Tamilnadu, India* (Ser.1: Analysis) 1:67; Cooke, T. (1967). *Flora of the Presidency of Bombay* 1: 224 (Repr. ed.); Gamble J.S. (1957). *Flora of the Presidency of Madras* 1:130 (Repr. ed.); Murthy, K. *Medicinal Plants of Karnataka;* Mohanan, N & A.N. Henry (1994). *Flora of Thiruvananthapuram* Vajravelu, E (1990). *Flora of Palakkad District*
Compilers:	Dr. V. Chelladurai, Dr. Keshava Murthy, Mr. G.S. Goraya, Ms. Meera Iyer, Dr. N. Loganatha'n, Dr. V.S. Ramachandran, Dr. M. Sivadasan

TAXON DATA SHEET

VU

Species (& synonyms):	***Artocarpus hirsutus* Lam.**
Family:	Moraeeae
Taxonomic status:	Species
Habit:	Tree
Habitat:	Moist evergreen to semi-evergreen forest
Original Global Distribution:	ENDEMIC to Western Ghats and West Coast
Current Regional Distribution:	Western Ghats and West Coast
-Elevation:	Up to 1,200 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	> 2,000
- Number of locations:	Not known
Population Trends - % change	
-% Decline:	> 20 %
- Time / Rate (Yrs or gens):	3 generations
- No. of Mature Individuals:	Not known
Global Population:	Declining
Data Quality:	General field study
Recent Field Studies:	Mangalore University botanical survey, 1995 in Charmadi and Subramanya MPCAs; C.G. Kushalappa, 1995 collection from Coorg; K. Ravi Kumar, 1996 -97 in Kudremukha, Charmadi and Subramanya MPCAs; V.S. Ramachandran in Topslip MPCA; P.S. Udayan, Oct. 1996 in Kudremukha and Charmadi MPCA; M.D. Subash Chandran 1985 till date in Uttara Kannada; S. Armougame. 1996 collected in Chenat Nayar Reserve Forest. Palakkad
Threats:	Loss of habitat; Trade; Harvest for timber
Trade:	Local; Domestic; Commercial
Other Comments:	The decline in population in the area of 1,200 m. is due to habitat loss. Timber is traded for domestic or commercial purposes, fruits traded locally.
Status	
- IUCN:	VULNERABLE
- Criteria based on:	Population reduction (A1a, 1c, 1d)
- -CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Survey; Taxonomic and morphological genetic studies
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	Already in plantation and cultivation
- Level of difficulty:	Least difficult
Existing Cultivations:	
- Names of facilities:	Private and Government plantation (field bund, road sides, farmland, as a shade tree in coffee and rubber plantation). Arboretum of Mangalore University.
Sources:	Personal observation/ comment: C.G. Kushalappa, K. Ravi Kumar, V.S. Ramachandran, P.S. Udayan, M.D. Subash Chandran, S. Armougame. Saldanha, C.J. (1984). *Flora of Karnataka* 1:112 Henry, A.N., G.R. Kumari & V Chitra (1987). *Flora of Tamil Nadu. India* (Ser.1: Analysis) 2:251 Gamble, J.S. (1957). *Flora of the Presidency of Madras* 3: 957 (Repr. ed.) Cooke, T (1958). *Flora of the Presidency of Bombay 3:* 157 (Repr. ed.) Ramachandran, V.S. & V.J. Nair (1988). *Flora of Cannanore* Vajravelu, E. (1990). *Flora of Palakkad District* Ahmedullah & M.P. Nayar (1987). *Endemic Plants of Indian Region,* Vol. 1
Compilers:	Dr. P. Venu, Mr. P.S. Udayan, Ms. Noorunissa Begum, Mr. A.E. Shanawaz Khan, Mr. D.K. Ved, Dr. P. Subramani, Ms. Caroline Priya, Dr. C.G. Kushalappa

TAXON DATA SHEET

EN-R

Species (& synonyms):	***Baliospermum montanum* (Willd.) Muell. -Arg.** **= B. *axillare* Blume** **= *B. polyandrum* Wight** **= *Jatropha montana* Willd.**
Family:	Euphorbiaceae
Taxonomic status:	Species
Habit:	Undershrub
Habitat:	Undergrowth in semi-evergreen forest at low elevations
Original Global Distribution:	Indo-Malaysia
Current Regional Distribution:	In peninsular India, Maharashtra, Karnataka, Tamil Nadu, Kerala and Andhra Pradesh
- Elevation:	Up to 600 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	< 500
- Number of locations:	Few: Fragmented
Population Trends - % change	
- % Decline:	20 - 30%
- Time / Rate (Yrs or gens):	10 years
- No. of Mature Individuals:	Not known
Global Population:	Not known
Regional Population:	Observed in fragmented populations in the region
Data Quality:	General field studies (Ellis, Calicut University, 1980s in Silent Valley; Keshava Murthy, 1986 in Nagarahole)
Recent Field Studies:	A.G. Pandurangan & A.E. Shanawaz Khan, 1995 -96 in Kerala; B.R. Ramesh, 1995 -96 in Karnataka; S. Armougame in Walayar, Olavakot, Nelliampathy and, Agali Ranges in Palakkad District; V.S. Ramachandran, Sep, 1996 in Parambikulam; Keshava Murthy, Sep. 1996 in Uttara Kannada
Threats:	Harvest for medicine; Loss of habitat because of fragmentation; Overexploitation; Trade
Trade:	Domestic; Commercial
Other Comments:	Seed collection for in trade affects natural regeneration. Roots are extensively used. Whole plant is used. Widely collected from wild. Almost wiped out in Coorg and Nagarahoie (Keshava Murthy)
Status	
- IUCN:	ENDANGERED (Regionally) DATA DEFICIENT (Globally)
- Criteria based on:	Extent of occurence (B1, 2c, 2d, 2e)
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Monitoring; Habitat management
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	Level 1
- Level of difficulty:	Not known
Existing Cultivations:	Plants grown in TBGRI in its existing programme
- Names of facilities:	TBGRI

Continued next page

Baliospermum montanum continued

Sources:	Personal observation/ comments: Ellis, Keshava Murthy, A.G. Pandurangan, A.E. Shanawaz Khan, B.R. Ramesh, S. Armougame V.S. Ramachandran Saldanha, C.J. (1996). *Flora of Karnataka* 2:119; Henry, A.N., G.R. Kumari & V. Chitra. (1987). *Flora of Tamil Nadu, India* (Ser.1 : Analysis) 2:222; Rao, R.S. (1986). *Flora of Goa, Diu, Daman, Dadra and Nagarhaveli* 2:381; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 2:939 (Repr. ed.); Cooke, T. (1958). *Flora of the Presidency of Bombay* 3:106 (Repr. ed.)
Compilers:	Mr. B.V. Shetty, Mr. Purushotham Singh, Dr. S.R. Ramesh, Dr. Ravi Kumar, Dr. A.G. Pandurangan, Dr. Ellis, Dr. K.R. Geetha. Ms. Latha

TAXON DATA SHEET

VU

Species (& synonyms):	***Calophyllum apetalum* Willd.** **= *C. decipiens* Wight** **= *C. wightianum* Wallich ex Planchon & Triana**
Family:	Clusiaceae
Taxonomic status:	Species
Habit:	Tree
Habitat:	Along the banks of rivers and streams in evergreen and semi-evergreen forests
Original Global Distribution:	ENDEMIC to Western Ghats.
Current Regional Distribution:	Maharashtra, Kamataka, Tamil Nadu and Kerala
-Elevation:	Up to 1,300 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	< 2,000
- Number of locations:	Many; Fragmented
Population Trends - % change	
- % Decline:	> 20%
- Time / Rate (Yrs or gens):	3 generations
- No. of Mature Individuals:	Not known
Global Population:	Declining
Data Quality:	General field study and indirect information
Recent Field Studies:	A.G. Pandurangan in Idukki dist.; Mangalore University Botany dept., 1995 in Subramanya, Charmadi, Devimane MPCAs; Keshava Murthy, 1996 in Anshighat and Patoli; S. Armougame, 1997 collected in Palamalai, Palakkad dist.; M.D. Subash Chandran, ongoing studies all over Uttara Kannada
Threats:	Harvest for medicine; Trade; Harvest for timber; Loss of habitat
Trade:	Domestic; Commercial
Other Comments:	Common throughout southern districts of Kerala (A.E. Shanawaz Khan). Fruits are in trade and wood for timber industry
Status	
- IUCN:	VULNERABLE
- Criteria based on:	Population reduction (A1a, 1c, 1d); Extent of occurence (B1, 2c, 2e)
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Monitoring; Habitat management; Genetic management
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	Level 1
- Level of difficulty:	Not known
Existing Cultivations:	
- Names of facilities:	TBGRI, Arboretum of Mangalore University
Sources:	Personal observation/ comments: A.G. Pandurangan, Keshava Murthy, S. Armougame, M.D. Subash Chandran, A.E. Shanawaz Khan. Singh, N.P. (1993). In Sharma, B.D. & M. Sanjappa, *Flora of India* 3:88. Saldanha, C.J. (1984). *Flora of Kamataka* 1:202; Nair, N.C. & A.N. Henry (1983). *Flora of Tamil Nadu, India* (Ser.1: Analysis) 1:27; Rao, R.S. (1985). *Flora of Goa, Diu, Daman, Dadra and Nagarhaveli* 1:28; Cooke, T. (1958). *Flora of the Presidency of Bombay* 1:86 (Repr. ed.). Gamble, J.S. (1957). *Flora of the Presidency of Madras*.1:54 (Repr. ed.). Troup (1975). *Silviculture of Indian Trees* Vol. 1. Vajravelu, E. (1990). *Flora of Palakkad Dist.* Mohanan, M. & A.N. Henry. *Flora of Thiruvananthapuram*
Compilers:	Dr. B.V. Shetty, Mr. Purushotham Singh, Dr. S.R. Ramesh, Dr. Ravi Kumar, Dr. A.G. Pandurangan, Dr. Ellis, Dr. K.R. Geetha, Ms. Latha

TAXON DATA SHEET

VU-R

Species (& synonyms):	***Canarium strictum* Roxb.**
Family:	Burseraceae
Taxonomic status:	Species
Habit:	Tree
Habitat:	Tropical deciduous to evergreen forest
Original Global Distribution:	Indo-Burma
Current Regional Distribution:	Western and Eastern Ghats
- Elevation:	Upto 1,200 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	< 2,000
- Number of locations:	Many; Fragmented
Population Trends - % change	
- % Decline:	> 20%'
- Time / Rate (Yrs or gens):	10 years
- No. of Mature Individuals:	Not known
Global Population:	Not known
Regional Population:	Declining gradually
Data Quality:	General field study
Recent Field Studies:	Mangalore University, 1995 in Subramanya MPCA; S. Armougame, 1996 in Attapadi, Walayar and Nelliampathy Ranges and 1997 in Muthikulam forests; M.B. Vishwanathan, 1992-96 in Kolli hills; Keshava Murthy, 1996 in Uttara Kannada; N. Mohanan, 1994 -95 in Kurisumalai; P.S. Udayan, 1997 in BRT Hills; A.E. Shanawaz Khan, 1996 in Pathanamthitta, Thiruvananthpuram dist; C.G. Kushalappa, 1996 in Coorg; N. Anil Kumar, 1992 -93 in Pathanamthitta; K. Ravi Kumar, 1983 -97 in Madurai, Kodaikanal, Tirunelveli, Kuthiraimukha MPCA
Threats:	Harvest for medicine; Overexploitation: Loss of habitat; Human interference (Man-made fire); Trade
Trade:	Commercial; International
Other Comments:	Tree surrounds are burnt to extract resin. Resin extracted for medicine and incense. Occurs abundantly in Kolli Hills, fragmented in Kerala. Resin is exported
Status	
- lUCN:	VULNERABLE (Regionally); DATA DEFICIENT (Globally)
- Criteria based on:	Population reduction (A1a, 1c, 1d); Extent of occurence (B1, 2c)
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Cultivation; Genetic
management	
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	Level 2
- Level of difficulty:	Very difficult
Existing Cultivations:	
- Names of facilities:	U.A.S., Bangalore, TBGRI, Arboretum of Mangalore University

Canarium strictum continued

Sources:

Personal observation/ comments: S. Armougame, M.B. Vishwanathan, Keshava Murthy, N. Mohanan, P.S. Udayan, A.E. Shanawaz Khan, C.G. Kushalappa, N. Anil Kumar, K. Ravi Kumar.

Saldanha, C.J. (1996). *Flora of Karnataka* 2:199

Nair, N.C. & A.N. Henry. (1983). *Flora of Tamil Nadu, India* (Ser.1 : Analysis) 1:64

Rao, R.S. (1985). *Flora of Goa, Diu, Daman, Dadra and Nagarhaveli* 1 :67

Cooke, T. (1958). *Flora of the Presidency of Bombay* 1:214 (Repr. ed.)

Gamble, J.S. (1957). *Flora of the Presidency of Madras* 1:122 (Repr. ed.)

Matthew. K.M. (1991). *An Excursion Flora of Central Tamil Nadu. India .* p. 73

Mathew, K.M. (1984). *Flora of Tamil Nadu-Carnatic*

Manilal, K.S. (1988). *Flora of Silent Valley*

Vajravelu, E. (1990). *Flora of Palakkad District*

Compilers:

Mr. B.V. Shetty, Mr. Purushotham Singh, Dr. S.R. Ramesh, Dr. Ravi Kumar, Dr. A.G. Pandurangan. Dr. Ellis, Dr. K.R. Geetha, Ms. Latha

TAXON DATA SHEET

VU-R

Species (& synonyms):	***Celastrus paniculatus Willd.* ssp. *paniculatus***
Family:	Celastraceae
Taxonomic status:	Sub species
Habit:	Climbing shrub
Habitat:	Dry, moist decidous to semi-evergreen
Original Global Distribution:	Indo-Malaysia and south China
Current Regional Distribution:	Kerala, Tamil Nadu and Karnataka
- Elevation:	Up to 1,200 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	> 5,000
- Number of locations:	Many
Population Trends - % change	
- % Decline:	20 %
- Time / Rate (Yrs or gens):	10 years
- No. of Mature Individuals:	Many
Global Population:	Not known
Regional Population:	Declining gradually
Data Quality:	General field study (M.B. Vishwanathan in N. Arcot, 1984 -86)
Recent Field Studies:	Keshava Murthy, 1996; N. Anil Kumar, 1992 -93 in Pathanamthitta: V.S. Ramachandran, 1995 in Topslip MPCA; M.B. Vishwanathan, 1992 -9.6 in Kolli Hills; S. Armougame, 1993 -96 in Palakkad,; C.G. Kushalappa, 1992 in Tumkur and 1995 in BRT Hills: A.E. Shanawaz Khan in Palode, Idukki and Palakkad; P.S. Udayan, 1996 in Kodanad and Kudremukh; Mangalore University Botany dept., 1995 in Charmadi and Subramanya MPCA; A.E. Shanawaz Khan & A.G. Pandurangan. 1996 in Triveni MPCA; K. Ravi Kumar, 1983 -97 in Madurai, Chengalpattu, South Arcot, Thenmaiai MPCA; N. Mohanan, 1994 -95 in Bonacaud; M.D. Subash Chandran, 1996 in Kumta
Threats:	Harvest for medicine; Loss of habitat; Trade of parts
Trade:	Commercial
Other Comments	Oil from seeds for massage (medicine). Extensively collected by tribals. Roots are also used in medicine, High exploitation for medicinal purpose especially seeds. Uprooting of plants might result in decline in mature individuals. The other subspecies is *agricatus* (K.M.Mathews). Dr. Seeni of TBGRI has standardised the protocol for multiplication of this species through tissue culture. Seeds, fruits, leaves and roots are commercially taded in large quantities. Seeds are recalcitrant and have low viability.
Status	
- IUCN:	VULNERABLE (Regionally); DATA DEFICIENT (Globally)
- Criteria based on:	Population reduction (A1a, 1c, 1d)
-CITES:	No
-IWPA(1972;91)$_i$	No
Recommendations	
- Research management:	Habitat management; Cultivation related studies
- P.H.V.A.:	Yes
Cultivation Program Recommendations	
- Cultivation:	Level 1
- Level of difficulty:	Not known. Studies needed.

Celastrus paniculatus ssp. *paniculatus* continued

Existing Cultivations:	Not known
- Names of facilities:	CIMH, MPCP
Sources:	Personal observations/ comments: Keshava Murthy, N. Anil Kumar, V.S. Ramachandran. M.B. Vishwanathan, S. Armougame, C.G. Kushalappa, A.E. Shanawaz Khan, P.S. Udayan, A.G. Pandurangan, K,,.Ravi Kumar, N. Mohanan, M.D. Subash Chandran. Saldanha, C.J. (1984). *Flora of Karnataka* 1:94 Nair, N.C. & A.N. Henry (1983). *Flora of Tamil Nadu, India* (Ser.1: Analysis) 1:73 Rao, R.S. (1985). *Flora of Goa, Diu, Daman, Dadra and Nagarhaveli* 1:75 Cooke, T.(1958). *Flora of the Presidency of Bombay* 1:245 (Repr. ed.) Gamble, J.S. (1957). *Flora of the Presidency of Madras* 1:150 (Repr. ed.) Matthew, K.M. (1991). *An Excursion Flora of Central Tamil Nadu, India* , p. 84 Matthew, K.M. (1984). *Flora of TN -Carnatic* Matthew, K.M. (1996). *Illustrations on the Flora of Palani Hills*
Compilers:	Dr. V. Chelladurai, Dr. Keshava Murthy, Mr. G.S. Goraya, Ms. Meera Iyer, Dr. N. Loganathan, Dr. V.S. Ramachandran, Dr. M. Sivadasan

TAXON DATA SHEET

EN-R

Species (& synonyms):	***Chonemorpha fragrans* (Moon) Alston.** **= *C. macrophylla* G.Don**
Family:	Apocynaceae
Taxonomic status:	Species
Habit.	Large woody climber (liana)
Habitat:	Moist deciduous to evergreen
Original Global Distribution:	Indo-Malayasia
Current Regional Distribution:	Southern India
- Elevation:	Up to 1,000m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	< 2,000
- Number of locations:	Infrequent, widely scattered
Population Trends - % change	
- % Decline:	> 50%
- Time / Rate (Yrs or gens):	10 years
No. of Mature Individuals:	Not known for the whole region. 5 in Sollekolli. Coorg; 2-3 in Anshi Ghats Uttara Kannada (Keshava Murthy).
Global Population:	Not known
Regional Population:	Declining
Data Quality:	Census and monitoring; General field studies (Keshava Murthy, 1986 in Coorg and 1988 in Uttara Kannada; N. Mohanan, 1980 in Thiruvananthapuram dist.)
Recent Field Studies:	S. Armougame, 1996 in Olavakot Range, Palakkad; A.E. Shanawaz Khan, 199-96 in Thiruvananthapuram dist. and Pathanamthitta; N. Mohanan, 1994 -95 in Bonacaud; N. Anil Kumar, 1992 -93 in Pathanamthitta; M.D. Subash Chahdran, 1996 in Kumta
Threats:	Loss of habitat; Harvest for medicine
Trade:	Not known
Other Comments:	Roots used in medicine (A.E. Shanawaz Khan)
Status	
- IUCN:	ENDANGERED (Regionally) DATA DEFICIENT (Globally)
- Criteria based on:	Population reduction (A1a, 1c)
-CITES:	No
-IWPA (1972;91):	No
Recommendations	
- Research management:	Survey; Monitoring; Habitat management; Life history studies
- P.H.V.A.:	Pending further data
Cultivation Program Recommendations	
- Cultivation:	Level 3
- Level of difficulty:	Not known
Existing Cultivations:	None
- Names of facilities:	
Sources:	Personal observations/ comments: S. Arumougame, A.E. Shanawaz Khan, N. Mohanan, N. Anil Kumar, Keshava Murthy, M.D. Subash Chandran. Henry, A.N., G.R. Kumari & V. Chitra (1987). *Flora of Tamil Nadu, India* (Ser. 1: Analysis) 2:77 Rao, R.S. (1986). *Flora of Goa, Diu, Daman and Dadra and Nagarhaveli* :255 Cooke, T. (1958). *Flora of the Presidency of Bombay* 2:202 (Repr. ed.) Gamble, J.S. (1957). *Flora of the Presidency of Madras* 2:575 (Repr. ed.) Saldanha, C.J. (1976). *Flora of Hassan District, Karnataka, India,* p. 433
Compilers:	Dr. V. Chelladurai, Dr. Keshava Murthy, Mr. G.S. Goraya, Ms. Meera Iyer, Dr. N. Loganathan, Dr. V.S. Ramachandran, Dr. M. Sivadasan

TAXON DATA SHEET

VU

Species (& synonyms):	***Cinnamomum malabatrum*(Burm. f.) Blume.** **= *C. macrocarpum* Hook. f.**
Family:	Lauraceae
Taxonomic status:	Species
Habit:	Tree
Habitat:	Moist deciduous to evergreen
Original Global Distribution:	ENDEMIC to peninsular India
Current Regional Distribution:	Peninsular India
- Elevation:	Up to 2,000 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	> 2,000
- Number of locations:	Not known
Population Trends - % change	
- % Decline:	> 30 %
- Time / Rate (Yrs or gens):	3 generations
- No. of Mature Individuals:	Not known
Global Population:	Declining
Data Quality:	Census and monitoring; General field study
Recent Field Studies:	K.V. Devar in Kemmangundi MPCA; A.E. Shanawaz Khan, 1996 in Thiruvananthapuram: C.G. Kushalappa, 1995 in Talacauvery: P.S. Udayan, 1995 in Sispara: Keshava Murthy in Uttara Kannada; K. Ravi Kumar, 1995 in Topslip MPCA and 1997 in Subramanya MPCA; N. Anil Kumar, 1992 -93 in Pathanamthitta; M.D. Subash Chandran, 1996 in Uttara Kannada
Threats:	Harvest for medicine: Trade for parts for medicine
Trade:	Domestic; Commercial; International
Other Comments:	Bark used for medicinal purpose and in Agarbatti preparation. Inter-state trade practised and exported
Status	
- IUCN:	VULNERABLE
- Criteria based on:	Population reduction (A1a, 1d)
- -CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Limiting factor research; Survey; Sustainable harvest
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	Level 1
- Level of difficulty:	Moderately difficult
Existing Cultivations:	None
- Names of facilities:	
Sources:	Personal observation/ comments: K.V. Devar, A.E. Shanawaz Khan, C.G, Kushalappa, P.S. Udayan, Keshava Murthy K. Ravi Kumar, N. Anil Kumar, M.D. Subash Chandran Saldanha, C.J. (1984). *Flora of Karnataka,* 1: 61. Nair, N.C. & A.N, Henry (1987). *Flora of Tamil Nadu, India* (Ser.1: Analysis) 2:208
Compilers;	Dr. P. Venu, Mr. P.S. Udayan, Ms. Noorunissa Begum, Mr. A.E. Shanawaz Khan, Mr. D.K. Ved, Dr. P. Subramani, Ms. Caroline Priya, Dr. C.G. Kushalappa

TAXON DATA SHEET

VU

Species (& synonyms):	***Cinnamomum sulphuratum Nees***
Family:	Lauraceae
Taxonomic status:	Species
Habit:	Tree
Habitat:	Moist deciduous to evergreen forest
Original Global Distribution:	ENDEMIC to Western Ghats
Current Regional Distribution:	Western Ghats
-Elevation:	1,300 - 2,000 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	< 2,000'
- Number of locations:	Not known
Population Trends - % change	
- % Decline:	>.20 %
- Time / Rate (Yrs or gens):	3 generations
- No. of Mature Individuals:	Not known
Global Population:	Declining gradually
Data Quality:	General field study
Recent Field Studies:	N. Sasidharan in Wynaad MPCA; N. Mohanan, 1994-95 in Agastyamalai; Keshava Murthy and S.N. Yoganarasimhan, 1994 -95 in Coorg; N. Anil Kumar, 1992 -93 in Pathanamthitta
Threats:	Trade for parts; Loss of habitat; Harvest for medicine
Trade:	Domestic; Commerial; International
Other Comments:	Bark for medicinal purpose and in Agarbathi industry.
Status	
- IUCN:	VULNERABLE
- Criteria based on:	Population reduction (A1a, 1c, 1d)
- CITES:	No
- IWPA(1972;91):	No
Recommendations	
- Research management:	Limiting factor research, Survey - search and find, Sustainable harvesting
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	Level 1
- Level of difficulty:	Moderately difficult
Existing Cultivations:	Not known
- Names of facilities:	--
Sources:	Personal observation/ comment: Keshava Murthy, S.N. Yoganarasimhan, N. Mohanan, N. Sasidharan, N. Anil Kumar Saldanha, C.J. (1984). *Flora of Karnataka* 1:62; Henry, A.N., G.R. Kumari & V. Chitra (1987). *Flora of Tamil Nadu, India* (Ser. 1: Analysis) 2:208; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 2:857 (Repr. ed.); Sharma, B.D. *et al.* (1977). Studies on the flora of Nilgiris, Tamil Nadu. Biol. Mem. (Angiosperm Taxonomy Ser. -1)2:122; Mohanan, M. & A.N. Henry (1994). *Flora of Thiruvananthapuram;* Manilal, K.S. (1988). *Flora of Silent Valley*
Compilers:	Dr. P. Venu, Mr. P.S. Udayan, Ms. Noorunissa Begum, Mr. A.E. Shanawaz Khan, Mr. D.K. Ved, Dr. P. Subramani, Ms. Caroline Priya, Dr. C.G. Kushalappa

TAXON DATA SHEET

EN-R

Species (& synonyms):	***Cinnamomum wightii Meissner***
Family:	Lauraceae
Taxonomic status:	Species
Habit:	Tree
Habitat:	Shola forest
Original Global Distribution:	Southern Western Ghats and Sri Lanka
Current Regional Distribution:	Southern Western Ghats
-Elevation:	1,275 to 2,500 m.
- Range (km^2):	< 5,000
- Area Occupied (km^2):	< 500
- Number of locations:	Few: Fragmented
Population Trends - % change	
- % Decline:	> 20 %
- Time 7 Rate (Yrs or gens):	3 generations
- No. of Mature Individuals:	Not known
Global Population:	Not known
Regional Population:	Restricted distribution and fragmented with declining population trend
Data Quality:	General field study
Recent Field Studies:	N. Sasidharan, 1994 -95 in botanical survey of Eravikulam MPCA; P.S. Udayan, 1996 during survey of Shola patches near Pykara. Doddabetta, Kotagiri
Threats:	Loss of habitat due to fragmentation: Trade; Harvest for medicine
Trade:	Local; Domestic; Commercial
Other Comments:	Restricted to Shola. Bark harvested for medicinal use. Shola species are very difficult to cultivate outside. No recent collections from Karnataka.
Status	
- IUCN:	ENDANGERED (Regionally) DATA DEFICIENT (Globally)
- Criteria based on:	Extent of occurrence (B1, 2c)
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Taxonomic and morphological genetic studies; Survey - search and find
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	Level 1
- Level of difficulty:	Very difficult
Existing Cultivations:	None
- Names of facilities:	--
Sources:	Saldanha, C.J. (1984). *Flora of Karnataka* 1:63; Henry, A.N., G.R. Kumari & V. Chitra (1987). *Flora of Tamil Nadu, India* (Ser. 1: Analysis) 2:209; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 2:857 (Repr. ed.); Sharma, B.D. *et al.* (1977). Studies on the flora of Nilgiris, Tamil Nadu. Biol. Mem. (Angiosperm Taxonomy Ser. -1) 2:122.
Compilers:	Dr. P. Venu, Mr. P.S. Udayan, Ms. Noorunissa Begum, Mr. A.E. Shanawaz Khan, Mr. D.K. Ved, Dr. P. Subramani, Ms. Caroline Priya, Dr. C.G. Kushalappa

TAXON DATA SHEET

DD-R

Species (& synonyms):	***Cleome burmanni* Wight & Arn.**
Family:	Capparaceae
Taxonomic status:	Species
Habit:	Herb
Habitat:	Not known
Original Global Distribution:	Not known
Current Regional Distribution:	
- Elevation:	Not known
- Range (km^2):	Not known
- Area Occupied (km^2):	Not known
- Number of locations:	Not known
Population Trends - % change	
- % Decline:	Not known
- Time / Rate (Yrs or gens):	Not known
- No. of Mature individuals:	Not known
Global Population:	Not known
Regional Population:	Not known
Data Quality:	
Recent Field Studies:	None
Threats:	Not known
Trade:	Not known
Other Comments:	M.D. Subash Chandran: Species identity and distribution should be reconfirmed S.N. Yoganarasimhan: The distribution should be checked in the known areas Vinay Tandon: To be sent to the experts. M.P. Nayar: The previous collections should be referred and distribution should be checked. S. Armougame: Naarthamalai in Trichy Dist. (1989). Herbarium specimen available in Tagore college will be made available for reference by him S.S.R. Bennet: The distribution with special reference to occurrence should be checked by consulting C.N. Mohanan, Scientist 'E', Centre for Earth Sciences, Akulam, Thiruvananthapuram. Copy is to be sent to Dr. M.P. Nayar. Ellis's collection from Vedaranyam, Tanjavur dist. made in 1962 and deposited in Mangalore Herbarium should be studied. Extremely rare and probably on way to extinction. Recorded in 1914 at Shencottah along Tamilnadu & Kerala border and 1962 in Tanjavur dist.. Tamil Nadu.
Status	
- IUCN:	DATA DEFICIENT (Regionally); DATA DEFICIENT (Globally)
- Criteria based on:	Not applicable
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Survey
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	No
- Level of difficulty:	Not known
Existing Cultivations:	None
- Names of facilities:	--
Sources:	Personal observation/comments: M.D. Subash Chandran, Vinay Tandon, M.P. Nayar, S. Armougame, Ellis, S.S.R. Bennet, S.N. Yoganarasimhan Sundararaghavan R.S. (1993). *Flora of India,* Vol. 2 : 304;
Compilers:	Dr. M.P. Nayar, Dr. M.D. Subash Chandran, Dr. S.N. Yoganarasimhan, Mr. A. Kareem, Dr. M.B. Vishwanathan, Mr. Vinay Tandon, Mr. S. Armougame, Dr. S.S.R. Bennet

TAXON DATA SHEET

VU

Species (& synonyms):	***Curcuma pseudomontana* Graham** = ***C. ranadei* Prain** **= *C. montana* sensu Baker non Roscoe**
Family:	Zingiberaceae
Taxonomic status:	Species
Habit:	Herb
Habitat:	Moist deciduous to semi-evergreen, usually along shady water courses
Original Gobal Distribution:	ENDEMIC to Western Ghats
Current Regional Distribution:	Western Ghats
-Elevation:	Upto 1,000 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	< 2,000
- Number of locations:	Not known
Population Trends - % change	
- % Decline:	> 30%
- Time / Rate (Yrs or gens):	10 years
- No. of Mature Individuals:	Not known
Global Population:	Declining gradually
Data Quality:	General field studies
Recent Field Studies:	A.E. Shanawaz Khan, 1996 in Thiruvananthapuram dist.; V.S. Ramachandran.1995 in Topslip MPCA; A.G. Pandurangan in Triveni
Threats:	Harvest for medicine; Overexploitation; Trade of parts
Trade:	Commercial
Other Comments:	Rhizomes and tubers in trade
Status	
- IUCN:	VULNERABLE
- Criteria based on:	Population Reduction (A1a, 1d)
- CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Habitat management
-P.H.V.A.:	Yes
Cultivation Program Recommendations	
- Cultivation:	Level 1
- Level of difficulty:	Least difficult
Existing Cultivations:	None
- Names of facilities:	
Sources:	Personal observation/ comments: A.E. Shanawaz Khan, V.S. Ramachandran, A.G. Pandurangan. Ahmedullah & M.P. Nayar (1987). *Endemic Plants of the Indian Region,* Vol. 1 Bhat, K.G. (1993). Studies on Zingiberaceae of Karnataka. *Higher Plants of Indian Subcontinent.* Vol. 4:86 (Additional Series of Indian J. Forestry No.7); Henry, A.N., V Chitra & N.P. Balakrishnan (1989). *Flora of Tamil Nadu, India* (Ser. 1: Analysis) 3:28; Cooke, T. (1958). *Flora of the Presidency of Bombay* 3:236 (Repr. ed.); Gamble, J.S. (1957). Flora of the Presidency of Madras 3:1036 (Repr. ed.); Santapau (1967). *Flora of Khandala.* Mangaly & Sabu (1987). *J. Ecm. Tax. Bot.* 10: 159 Ruo & Razi (1981). *Synop. H. Mysore Dist.,* Mangaly & Sabu (1993). *Rhudea* 3(2): 165 Manilal, K.S. & Sivarajan (1982). *Flora of Calicut*
Compilers:	Dr. P. Venu, Mr. PS. Udayan, Ms. Noorunissa Begum, Mr. A.E. Shanawaz Khan, Mr. D.K. Ved, Dr. P. Subramani, Ms. Caroline Priya, Dr. C.G. Kushalappa

TAXON DATA SHEET

LRNT -R

Species (& synonyms):	***Curcuma zedoaria* (Christm.) Roscoe** = ***C. zerumbet Roxb.***
Family:	Zingiberaceae
Taxonomic status:	Species
Habit:	Herb
Habitat:	Moist deciduous forest
Original Global Distribution:	Indo-Malaysia
Current Regional Distribution:	Peninsular India
- Elevation:	1,000 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	> 2,000
- Number of locations:	Few
Population Trends - % change	
- % Decline:"	Not known
- Time / Rate (Yrs or gens):	Not known
- No. of Mature Individuals:	Not known
Global Population:	Not known
Regional Population:	Widely distributed in peninsular India
Data Quality:	General field study (S.N. Yoganarasimhan, 1980)
Recent Field Studies:	V.S. Ramachandran, 1995 in Topslip; N. Sasidharan in Athirapally; N. Anil Kumar, 1992 -93 in Pathanamthitta
Threats:	Harvest for medicine; Trade for parts for medicine (rhizome)
Trade:	Local; Domestic; Commercial
Other Comments:	Found wild only in Chikmagalur. Rhizome used for medicinal purpose & Dye. No recent collection from the wild.
Status	
- IUCN:	LOWER RISK - NEAR THREATENED (Regionally); DATA DEFICIENT (Globally)
- Criteria based on:	--
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Survey; Taxonomic and morphological genetic studies; Limiting factor management
- P.H.V.A.:	Yes
Cultivation Program Recommendations	
- Cultivation:	No
- Level of difficulty:	Not known
Existing Cultivations:	None
- Names of facilities:	--
Sources:	Personal observation/comments: S.N. Yoganarasimhan, V.S. Ramachandran, N. Sasidharan, N. Anil Kumar Henry, A.N., V. Chitra & N.P. Balakrishnan (1989). *Flora of Tamil Nadu, India* (Ser. 1: Analysis) 3:28; . Yoganarasimhan, S.N., K. Subramanyam & B.A. Razi (1981). *Flora of Chikmagalur District, Karnataka,* India, P. 341; Gamble, J. S. (1957). *Flora of the Presidency of Madras* 3: 1036 (Repr. ed.); Cooke, T. (1958). *Flora of the Presidency of Bombay* 3:238 (Repr. ed.) Mangaly&Sabu(1993). Rhudea 3(2): 168
Compilers:	Dr. P. Venu, Mr. P.S. Udayan, Ms. Noorunissa Begum, Mr. A.E. Shanawaz Khan, Mr. D.K. Ved, Dr. P. Subramani, Ms. Caroline Priya, Dr. C.G. Kushalappa

TAXON DATA SHEET

VU

Species (& synonyms):	***Dalbergia horrida* (Dennst.) Mabberely** **= *D. sympathetica* Nimmo**
Family:	Fabaceae
Taxonomic status:	Species
Habit:	Climbing shrub
Habitat:	Moist deciduous
Original Global Distribution:	ENDEMIC to Peninsular India
Current Regional Distribution:	Western Ghats, Lower hills from Dakshina Kannada to Travancore and Tiruneivelli
- Elevation:	Up to 600 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	> 2,000
- Number of locations:	Not known
Population Trends - % change	
- % Decline:	> 20 %
- Time / Rate (Yrs or gens):	3 generations
- No. of Mature Individuals:	Not known
Global Population:	Gradually declining
Data Quality:	General field study
Recent Field Studies:	A.G. Pandurangan and M. Raveendran Botanical survey of Triveni MPCA ; V. Chelladurai and P. Subramani, 1995 in Courtallam; M. D. Subash Chandran 1996 in Uttara Kannada
Threats:	Loss of habitat; Harvest for medicine
Trade:	No
Other Comments:	Used in folk medicine. Common in Sacred Groves in Udipi (B.V. Shetty). This species has three varieties. Infraspecific categories have not been considered while assessing. (Occurs mere in degraded forests)
Status	
- IUCN:	VULNERABLE
- Criteria based on:	Population reduction (A1a, 1c)
- CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Taxonomic and morphological genetic studies, Monitoring
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	Pending further data
- Level of difficulty:	Not known
Existing Cultivations:	
- Names of facilities:	Arboretum of Mangalore University
Sources:	Personal observation/ comments: P. Subramani, A.G. Pandurangan, V. Chelladurai Saldanha, C.J. (1984). *Flora of Karnataka* 1:444; Nair, N.C. & A.N. Henry, (1983). *Flora of Tamil Nadu, India* (Ser. 1: Analysis) 1:104; Cooke, T. (1958). *Flora of the Presidency of Bombay* 1:424 (Repr. ed.)
Compilers:	Dr. P. Venu, Mr. P.S. Udayan, Ms. Noorunissa Begum, Mr. A.E. Shanawaz Khan, Mr. D.K. Ved, Dr. P. Subramani, Ms. Caroline Priya, Dr. C.G. Kushalappa

TAXON DATA SHEET

EN

Species (& synonyms):	***Decalepis hamiltonii* Wight** & **Arn.**
Family:	Periplocaceae
Taxonomic status:	Species
Habit:	Climber
Habitat:	Dry to moist deciduous forests on rocky places
Original Global Distribution:	ENDEMIC to peninsular India
Current Regional Distribution:	Peninsular India
-Elevation:	500 -1,100 m.
- Range (km^2):	< 20,000
- Area Occupied (km^2):	<500
- Number of locations:	Few; Fragmented
Population Trends - % change	
- % Decline:	20%
- Time / Rate (Yrs or gens):	10 years
- No. of Mature Individuals:	Not known
Global Population:	Declining gradually but restricted in area of occupancy
Data Quality:	General field studies
Recent Field Studies:	A.G. Pandurangan; K. Ravi Kumar, 1984-96 in Madurai, Thenmalai MPCA; M.B. Vishwanathan, 1994 -96 in Alagarkoil MPCA; P.S. Udayan, November 1996 in Pulinyansholai, Trichur dist..
Threats:	Overexploitation: Browsing by Goats; Harvest for medicine; Trade of parts (Roots, leaves); Loss of habitat
Trade:	Domestic; Commercial; International
Other Comments:	Genus *Decalepis* is monotypic. Regeneration is severely affected since most of the plants are harvested prior to seed setting. Roots, leaves, follicles medicinal, roots pickled. Root harvested in high quantities in hunderds of tonnes from BRT Hills for pickling and medicinal purposes. It is also used as a substitute for *Hemidesmus indicus* (Sariva).
Status	
- IUCN:	ENDANGERED
- Criteria based on:	Extent of occurence (B1, 2c, 2e)
- CITES:	No
-IWPA(1972:91):	No
Recommendations	
-Research management:	Genetic management
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	Level 1
- Level of difficulty:	Not known
Existing Cultivations:	
- Names of facilities:	In Botanical Garden, U.A.S, G.K.V.K. Bangalore
Sources:	Personal observation/ comments: A.G. Pandurangan, K. Ravi Kumar, P.S. Udayan, M.B. Vishwanathan Henry, A.N., G.R. Kumari & V. Chitra. (1987). *Flora of Tamil Nadu, India* (Ser. 1 : Analysis) 2:90; Henry, A.N., G.R. Kumari & V. Chitra. (1987). *Flora of Tamil Nadu,* Vol.2 , P. 91. Distribution from Chengalpet, Coimbatore, Dharmapuri & Nilgiri dist. Gamble, J.S. (1957). *Flora of the Presidency of Madras* 2:582 Hooker, *Flora of British India* Yoganarasimhan, S.N. (1996). *Medicinal Plants of India* (Kamataka), Vol. 1
Compilers:	Mr. B.V. Shetty, Mr. Purushotham Singh, Dr. S.R. Ramesh, Dr. Ravi Kumar, Dr. A.G. Pandurangan, Dr. Ellis, Dr. K.R. Geetha, Ms. Latha

TAXON DATA SHEET

VU

Species (& synonyms):	***Dendrobium ovatum* (Willd.) Kranzl.**
Family:	Orchidaceae
Taxonomic status:	Species
Habit:	Epiphytic herb
Habitat	Epiphytic on trees and roots along open grasslands in moist decidous to semi evergreen forests
Original Global Distribution:	ENDEMIC to Western Ghats
Current Regional Distribution:	Western Ghats
- Elevation:	50 -1,500 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	> 2,000
- Number of locations:	Many
Population Trends - % change	
- % Decline:	20%
- Time / Rate (Yrs or gens):	10 years
- No. of Mature Individuals:	Many, fairly common
Global Population:	Gradual decline in population numbers
Data Quality:	General field study
Recent Field Studies:	Keshava Murthy, Dec 1996 in Uttara Kannada; A.E. Shanawaz Khan, 1995 in Thiruvananthapuram. Vagamon; N. Mohanan, 1994-95 in Agastyamalai; N. Anil Kumar, 1992-93 in Pathanamthitta
Threats:	Loss of habitat; Human interference (man-made fire); Loss of habitat due to fragmentation
Trade:	Not known.
Other Comments:	Information on trade not available
Status	
- IUCN:	VULNERABLE
- Criteria based on:	Population reduction (A1a, 1c)
- -CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Monitoring
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	No
- Level of difficulty:	Not known
Existing Cultivations:	Not known
- Names of facilities:	--
Sources:	Personal observation/ comments: Keshava Murthy, A.E. Shanawaz Khan, N. Mohanan, N. Anil Kumar Gamble, J.S. (1957). *Flora of the Presidency of Madras* 3:990 Vajravelu, E. (1990). *Flora of Palakkad District,* p. 474 Ahmedullah, M. & M.P. Nayar. (1986). *Endemic Plants of the Indian Region* 1:246 Abraham, A. & P. Vatsala (1981). *Introduction to Orchids*
Compilers:	Dr. V. Chelladurai, Dr. Keshava Murthy, Mr. G.S. Goraya, Ms. Meera Iyer, Dr. N. Loganathan, Dr. V.S. Ramachandran, Dr. M. Sivadasan

TAXON DATA SHEET

VU

Species (& synonyms):	***Diospyros* candolleana Wight.**
Family:	Ebenaceae
Taxonomic status:	Species
Habit:	Tree
Habitat:	Moist deciduous to evergreen
Original Global Distribution:	ENDEMIC to Western Ghats
Current Regional Distribution:	Western Ghats
- Elevation:	Up to 900 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	< 2,000
- Number of locations:	Not known
Population Trends - % change	
- % Decline:	> 20%
- Time / Rate (Yrs or gens):	3 generations
- No. of Mature Individuals:	Not known
Global Population:	Declining gradually and restricted area of occupancy
Data Quality:	General field study
Recent Field Studies:	A.E. Shanawaz Khan, 1995 in Thiruvananthapuram dist. and Pathanamthitta dist. Keshava Murthy, December 1996 in Uttara Kannada; N. Anil Kumar, 1992-93 in Pathanamthitta; Mangalore University Botany Department, 1995 in Charmadi and Subramanya MPCAs; M.D. Subash Chandran, 1996 in Uttara Kannada
Threats:	Loss of habitat; Harvest for medicine: Trade
Trade:	Local
Other Comments:	Decoction of root bark used in rheumatism and swelling

Status

- IUCN:	VULNERABLE
- Criteria based on:	Population reduction (A1a, 1c)
-CITES:	No
-IWPA(1972:91):	No

Recommendations

- Research management:	Monitoring
-P.H.V.A.:	No

Cultivation Program Recommendations

- Cultivation:	No
- Level of difficulty:	Not known
Existing Cultivations:	Not known
- Names of facilities:	--

Sources:

Personal observation/ comments: A.E. Shanawaz Khan, Keshava Murthy, M.D. Subash Chandran, N. Anil Kumar

Saldanha, C.J. (1984). *Flora of Karnataka* 1:335;
Henry, A.N., G. R. Kumari & V. Chitra. (1987). *Flora of Tamil Nadu, India (Ser.1* : Analysis) 2:65
Gamble, J.S. (1957). *Flora of the Presidency of Madras* 2:543 (Repr. ed.)
Cooke, T (1958). *Flora of the Presidency of Bombay* 2:161 (Repr. ed.)
Rao, R.S. (1986). *Flora of Goa, Diu, Daman, Dadra and Nagarhaveli* 2:247.

Compilers:

Dr. P. Venu, Mr. P.S. Udayan, Ms. Noorunissa Begum, Mr. A.E. Shanawaz Khan, Mr. D.K. Ved, Dr. P. Subramani, Ms. Caroline Priya, Dr. C.G. Kushalappa

TAXON DATA SHEET

VU

Species (& synonyms):	***Diospyros paniculata* Dalz.**
Family:	Ebenacaceae
Taxonomic status:	Species
Habit:	Tree
Habitat:	Moist semi evergreen forests
Original Global Distribution:	ENDEMIC to western peninsular India
Current Regional Distribution:	Western peninsular India
-Elevation:	Up to 1.000 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	> 2,000
- Number of locations:	8 to 9 (Coimbatore, Nilgiri, Uttara & Dakshina Kannada, Konkan, Shimoga); Fragmented
Population Trends,- % change	
- % Decline:	30 %
- Time / Rate (Yrs or gens):	3 generations
- No. of Mature Individuals:	Not known
Global Population:	Stable in Uttara Kannada; Decline in Shimoga, Kerala and Tamilnadu. Populations are fragmented .
Data Quality:	General field studies
Recent Field Studies:	S.N. Yoganarasimhan, 1990 -96 in Uttara Kannada and Shimoga; A.G. Pandurangan, 1993 -94 in Agastyamalai; K. Ravi Kumar, 1994 -95 in Kanyakumari Hills; N. Mohanan, 1994-95 in Agastyamalai; N. Anil Kumar 1992-93 in Pathanamthitta
Threats.	Loss of habitat because of fragmentation; Loss of habitat because of exotic plants: Harvest for medicine; Trade
Trade:	Local
Other Comments:	Species is dioecious.
Status	
- IUCN:	VULNERABLE
- Criteria based on:	Population reduction (A1 a, 1c. 1d)
- CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Habitat management; Life History Studies; Survey
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	No
- Level of difficulty:	Not known
Existing Cultivations:	Not known
- Names of facilities:	
Sources:	Personal observation/ comments: S.N. Yoganarasimhan, A.G. Pandurangan, K. Ravi Kumar, N. Anil kumar, N. Mohanan Saldanha, C.J. (1984). *Flora of Karnataka* 1:340; Henry, A.N., G.R. Kumari & V. Chitra. (1987). *Flora of Tamil Nadu, India* (Ser.1 : Analysis) 2:67; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 2:544 (Repr. ed.); Cooke, T (1958). *Flora of the Presidency of Bombay* 2:163 (Repr. ed.) Rao, R. S. (1986). *Flora of Goa, Diu, Daman, Dadra and Nagarhaveli* 2:248; Mohanan, N. & A.N. Henry (1994). *Flora of Thiruvananthapuram* Vajravelu, E. (1990). *Flora of Palakkad*
Compilers:	Dr. M.P. Nayar, Dr. M.D. Subash Chandran, Dr. S.N. Yoganarasimhan, Mr. A. Kareem, Dr. M.B. Vishwanathan, Mr. Vinay Tandon, Mr. S. Armougame, Dr. S.S.R. Bennet

TAXON DATA SHEET

EN

Species (& synonyms):	***Dipterocarpus indicus* Beddome**
Family:	Dipterocarpaceae
Taxonomic status:	Species
Habit:	Large Tree
Habitat:	Semi-evergreen to evergreen forests
Original Global Distribution:	ENDEMIC to central and southern Western Ghats
Current Regional Distribution:	Central and southern Western Ghats
- Elevation:	300 -1.000 m.
- Range (km^2):	> -20,000,
- Area Occupied (km^2):	> 2,000
- Number of locations:	Many
Population Trends - % change	
- % Decline:	> 50 %
- Time / Rate (Yrs or gens):	3 generations
- No. of Mature Individuals:	Not known
Global Population:	Declining rapidly
Data Quality:	General field studies
Recent Field Studies:	M.D. Subash Chandran, 1995 observed in Thiruvananthapuram and Chenattiar Range in Kerala and 1985 onwards Quantitative Ecological study in Uttara Kannada; S. Armougame, 1996 collected in Kalchadi forest Nelliampathy range: N. Mohanan, 1994-95 in Attayae, Kerala; A.E. Shanawaz Khan in Arayangau and Pamba, Kerala 1996; Mangalore University Botany Dept., 1995 in Charmadi and Subramanya MPCAs; M.D. Subash Chandran, 1996 Honavar & Siddapur in Uttara Kannada; C.G. Kushalappa, 1997 in Udumbe, Coorg district.
Threats:	Loss of habitat; Harvest for timber, Trade
Trade:	Domestic: Commercial
Other Comments:	Oil is extracted from the fruit.
Status	
-IUCN	ENDANGERED
- Criteria based on:	Population reduction (A1 a. 1c, 1d)
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Life history studies; Habitat management;
Survey	
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	Level 1
- Level of difficulty:	Not known
Existing Cultivations:	
- Names of facilities:	Arboretum of Mangalore University.
Sources:	Personal observation / comments: M.D. Subash Chandran, N. Mohanan, S. Armougame, A.E. Shanawaz Khan, C.G. Kushalappa Janardhanan, K.P. (1993). In Sharma, B.D. and M. Sanjappa (Eds.), *Flora of India* 3:214 Saldanha, C.J. (1984). *Flora of Karnataka* 1:191 Nair, N.C. & Henry. (1983). *Flora of Tamil Nadu, India* (Ser. 1: Analysis) 1:30 Gamble, J.S. (1957). *Flora of the Presidency of Madras* 1:58 (Repr. ed.) Vajravelu, E. (1990). *Flora of Palakkad District,* p.74 Ramamurthy (1976). In Saldanha & Nicols., *Flora of Hasan Dist.*
Compilers:	Dr. M.P. Nayar, Dr. M.D. Subash Chandran, Dr. S.N. Yoganarasimhan, Mr. A. Kareem, Dr. M.B. Vishwanathan, Mr. Vinay Tandon, Mr. S. Armougame, Dr. S.S.R. Bennet

TAXON DATA SHEET

EN

Species (& synonyms):	***Dysoxylum malabaricum* Beddome ex Hierr**
Family:	Meliaceae
Taxonomic status:	Species
Habit:	Large Tree
Habitat:	Evergreen forests
Original Global Distribution:	ENDEMIC to central and southern Western Ghats.
Current Regional Distribution:	Karnataka: Kodagu, Mysore, Shimoga, Coorg, Uttara & Dakshina Kannada Tamil Nadu: Anaymalai's, Coimbatore, Nilgiris; Kerala: Palakkad, Travancore
- Elevation:	Up to 1,000 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	> 2,000
- Number of locations:	Many; Trees well dispersed in the forest one or two per hectare
Population Trends - % change	
- % Decline:	> 50 %
- Time / Rate (Yrs or gens):	3 generations
- No. of Mature Individuals:	Not known
Globai Population:	Declining
Data Quality:	General field studies (Keshava Murthy, 1984 in Uttara Kannada)
Recent Field Studies:	M.B. Subash Chandran, 1985 onwards in Uttara Kannada; S. Armougame, 1996 survey in Karapara, Palakkad, Kalchadi; V.S. Ramachandran, 1994 in Topslip MPCA; Keshava Murthy, 1995 in Uttara Kannada; A.E. Shanawaz Khan, 1996 in Agastyamalai: C.G. Kushalappa, 1995 in Kunda Forest, Coorg & 1997 in Makut: N. Anil Kumar 1992-93 in Pathanamthitta
Threats (Key):	Loss of habitat; Loss of habitat because of fragmentation; Overexploitation; Loss of habitat because of exotic plants; Harvest for timber; Harvest for medicine; Trade
Trade:	Domestic; Commercial
Other Comments:	Heartwood used for medicine; destructive collections. Substitute for *Aquilaria agallocha* for medicinal purposes. Industrial demand heavy for Plywood
Status	
-IUCN:	ENDANGERED
- Criteria based on:	Population reduction (A1a, 1c, 1d, 1e)
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Survey; Habitat management; Life history studies; Monitoring
-P.H.V.A.:	Pending results
Cultivation Program Recommendations	
- Cultivation:	Level 1
- Level of difficulty:	Moderately difficult
Existing Cultivations:	Not known
- Names of facilities:	
Sources:	Personal observation/ comments: M.D. Subash Chandran, V.S. Ramachandran, Keshava Murthy, A.E. Shanawaz Khan, S. Armougame, C.G. Kushalappa. Saldanha, C.J. (1984). *Flora of Karnataka* 1:233 Nair, N.C. & A.N. Henry. (1983). *Flora of Tamil Nadu, India* (Ser.1 : Analysis) 1:67 Gamble, J.S. (1957). *Flora of the Presidency of Madras* 1:128 (Repr. ed.) Cooke, T. (1958). *Flora of the Presidency of Bombay* 1:221 (Repr. ed.).
Compilers:	Dr. M.P. Nayar, Dr. M.D. Subash Chandran, Dr. S.N. Yoganarasimhan, Mr. A. Kareem, Dr. M.B. Vishwanathan, Mr. Vinay Tandon, Mr. S. Armougame, Dr. S.S.R. Bennet

TAXON DATA SHEET

LRNT -R

Species (& synonyms):	***Elaeocarpus serratus* L.**
Family:	Elaeocarpaceae
Taxonomic status:	Species
Habit:	Small to medium tree
Habitat:	Moist deciduous to semi evergreen forests
Original Global Distribution:	Indo-Malaysia
Current Regional Distribution:	Southern India
- Elevation:	Up to 1,500 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	> 2.000
- Number of locations:	Many
Population Trends - % change	
- % Decline:	< 10 %
- Time / Rate (Yrs or gens):	2 generations
- No. of Mature Individuals:	Not known
Global Population:	Not known
Regional Population:	General decline but widely distributed
Data Quality:	General field studies
Recent Field Studies:	S. Armougame, 1996 surveyed in all forest ranges of Palakkad; M.B. Vishwanathan, 1992 -96 in Koili hills; M.D. Subash Chandran, 1984 onwards in Uttara & Dakshina Kannada; N. Mohanan, 1994-95 in Agastyamalai; N. Anil Kumar, 1992-93 in Pathanamthitta; Keshava Murthy in Coorg; V.S. Ramachandran, 1994 in Topslip; A.E. Shanawaz Khan, 1994 in Pamba valley, Thiruvananthapuram dist.; P.S. Udayan, Priya and Noorie, July 1996 botanical survey in Kudremukh MPCA; Mangalore University Botany Dept., 1995 Kudremukh, Triveni in Charmadi and Subramanya MPCAs; K. Ravi Kumar, 1983-97 in Madurai, Tirunelveli, Kodai hills, Kanyakumari, Idukki, Subramanya & Charmadi MPCA
Threats:	Loss of habitat; Harvest
Trade:	Not known
Other Comments:	Fruits edible, pickled; plenty of regeneration observed in Palakkad & Tamil Nadu. Tribals collect fruits for seasonal use.
Status	
- IUCN:	LOWER RISK - NEAR THREATENED (Regionally) DATA DEFICIENT (Globally)
- Criteria based on:	Not applicable
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	No
-P.H.V.A.:	No
Cultivation Program Recommendations	
-Cultivation:	No
- Level of difficulty:	Not known
Existing Cultivations:	Not known
- Names of facilities:	--

Elaeocarpus serratus continued

Sources:

Personal observation/ comments: M.D. Subash Chandran, S. Armougame, N. Mohanan, P.S. Udayan, Noorie, Keshava Murthy, Priya, A.E. Shanawaz Khan,V.S. Ramachandran, M.B. Vishwanathan
Murti. S.K. (1993). in Sharma, B.D. & M. Sanjappa (Eds.) *Flora of India* 3: 553.
Saidanha, C.J. (1984). *Flora of Karnataka* 1:212;
Nair, N.C. & A.N. Henry. (1983). *Flora of Tamil Nadu, India* (Ser.1 : Analysis) 1:46;
Gamble, J.S. (1957). *Flora of the Presidency of Madras* 1:88 (Repr. ed.);
Cooke,T. (1958). *Flora of the Presidency of Bombay* 1 :161 (Repr. ed.)
Ramamurthy (1976). In Saldanha & Nicols., *Flora of Hasan dist.,*
Mathew & Britto (1993). *In Mathew Flora of Carnatic*
Mohanan, N. & A. N. Henry (1994). *Flora of Thiruvananthapuram*
Ramachandran, V.S. & V.J. Nair (1988). *Flora of Cannanore*

Compilers:

Dr. M.P. Nayar, Dr. M.D. Subash Chandran, Dr. S.N. Yoganarasimhan, Mr. A. Kareem, Dr. M.B. Vishwanathan, Mr. Vinay Tandon, Mr. S. Armougame, Dr. S.S.R. Bennet

TAXON DATA SHEET

EN-R

Species (& synonyms):	***Embelia tsjeriam-cottam* (Roemer & Schutes) DC.** **= *E. robusta* auct. non Roxb.** **= *E. villosa* Wall. ex Roxb.** **= E. *acutipetalum* (Lam. ex Hassk.) S.M. Almeida & M.R. Almeida**
Family:	Myrsinaceae
Taxonomic status:	Species
Habit:	Shrub
Habitat:	Moist deciduous forests - also in semi evergreen forests. Occasionally in dry deciduous forests.
Original Global Distribution:	India, Sri Lanka and Myanmar
Current Regional Distribution:	In Peninsular India, Maharashtra, Tamilnadu, Andhra Pradesh, Karnataka and Kerala
- Elevation:	600-1,600 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	< 500
- Number of locations:	5; Fragmented
Population Trends - % change	
- % Decline:	20 %
- Time / Rate (Yrs or gens):	10 years
- No. of Mature Individuals:	Not known
Global Population:	Not known
Regional Population:	Declining
Data Quality:	General field studies; Indirect information
Recent Field Studies:	A.G. Pandurangan, 1995 -96 in Idukki; K. Ravi Kumar, 1987 -91 in Megamalai, Madurai; S, Armougame, 1996 in Attapadi and Walayar Ranges; C.G. Kushalappa in Pechiparai MPCA and Devarayanadurga; N. Mohanan, 1994-95 in Agastyamalai
Threats:	Harvest for medicine; Loss of habitat due to fragmentation; Land slides; Trade
Trade:	Local; Domestic; Commercial
Other Comments:	Seeds used as adulterant with *E. ribes* (Vidang). According to Sanskrit texts of Ayurveda, Vidang is a mixture of seeds of *Embelia* species
Status	
- IUCN:	ENDANGERED (Regionally); DATA DEFICIENT (Globally)
- Criteria based on:	Extent of occurence (B1, 2c)
-CITES:	No
-!WPA(1972;91):	No
Recommendations	
- Research management:	Monitoring; Taxonomic studies required to determine the status of the species
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	No
- Level of difficulty:	Very difficult
Existing Cultivations:	None
- Names of facilities:	--
Sources:	Personal observation/ comments: K. Ravi Kumar, C.G. Kushalappa, S. Armougame, A.G. Pandurangan. Saldanha, C.J. (1984). *Flora of Karnataka* 1:350 Henry, A.N., G. R. Kumari & V Chitra. (1987). *Flora of Tamil Nadu, India* (Ser.1 : Analysis) 2:61 Gamble, J.S. (1957). *Flora of the Presidency of Madras* 2:529 (Repr. ed.) Cooke, T. (1958). *Flora of the Presidency of Bombay* 2:144 (Repr. ed.) Rao, R.S. (1986). *Flora of Goa, Diu, Daman, Dadra and Nagarhaveli* 2:233
Compilers:	B.V. Shetty, Mr. Purushotham Singh, Dr. S.R. Ramesh, Dr. K. Ravi Kumar, Dr. A.G. Pandurangan, Dr. Ellis, Dr. K.R. Geetha, Ms. Latha

TAXON DATA SHEET

CR

Species (& synonyms):	***Eulophia cullenii* (Wight) Blume**
Family:	Orchidaceae
Taxonomic status:	Species
Habit:	Herbs
Habitat:	In Grasslands
Original Global Distribution:	ENDEMIC to southern Western Ghats
Current Regional Distribution:	Southern Western Ghats (Agastyamalai)
-Elevation:	600-1,000 m.
- Range (km^2):	< 100
- Area Occupied (km^2):	< 10
- Number of locations:	5: Fragmented
Population Trends - % change	
- % Decline:	50 %
- Time /Rate (Yrs or gens):	10 years
- No. of Mature Individuals:	Not known
Global Population:	Declining rapidly in highly restricted area of occupancy
Data Quality:	General field study
Recent Field Studies:	A.G. Pandurangan and Raj Vikraman, 1995 -96 in Agastyamalai
Threats:	Harvest for medicine; Loss of habitat (under grassland reclamation.Program of the Forest Department); Human interference; Predation (tubers eaten away by wild boars); Trade
Trade:	Local; Domestic
Other Comments:	Its a very narrow endemic.
Status	
-IUCN;	CRITICALLY ENDANGERED
-Criteria based on:	Extent of occurrence (B1, 2c, 2e)
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
-Research management:	Survey; Monitoring
-P.H.V.A.:	Yes
Cultivation Program Recommendations	
- Cultivation:	No
- Level of difficulty.	Least difficult (through tubers)
Existing Cultivations:	
- Names of facilities:	TBGRI's *ex situ* nursery
Sources:	Personal observation/ comments: A.G. Pandurangan, Henry, A.N., V. Chitra & N.P. Balakrishnan (1989). *Flora of Tamil Nadu, India* (Ser. 1: Analysis) 3:11; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 3: 1003 (Repr. ed.) Mohanan, N. & A.N. Henry (1994). *Flora of Thiruvananthapuram,* Kerala
Compilers:	Mr. B.V. Shetty, Mr. Purushotham Singh, Dr. S.R. Ramesh, Dr. K. Ravi Kumar, Dr. A.G. Pandurangan, Dr. Ellis, Dr. K.R. Geetha, Ms. Latha

TAXON DATA SHEET

CR

Species (& synonyms):	***Eulophia ramentacea* Lindl. ex Wight** **= *E. pratensis* Lindl.**
Family:	Orchidaceae
Taxonomic status:	Species
Habit:	Herb
Habitat:	Usually in grasslands.
Original Global Distribution:	ENDEMIC to peninsular India
Current Regional Distribution:	Western Ghats, Gujarat, Mysore, Raichur, Panchagani, Khandala and Dakshina
Kannada	
- Elevation:	600 - 1,500 m.
- Range (km^2):	< 20,000
- Area Occupied (km^2):	< 10
- Number of locations:	Few; Fragmented
Population Trends - % change	
- % Decline:	50 %
- Time / Rate (Yrs or gens):	10 years
- No. of Mature individuals:	Not known
Global Population:	Declining rapidly in highly restricted area of occupancy
Data Quality:	General field study (M.P. Nayar); Indirect studies
Recent Field Studies:	None
Threats:	Loss of habitat; Human interference
Trade:	Not known
Other Comments:	
Status	
-IUCN:	CRITICALLY ENDANGERED
- Criteria based on:	Extent of occurence (B1, 2c)
-CITES:	No
-IWPA(1972;91):	
Recommendations	
- Research management:	Monitoring; Genetic management
-P.H.V.A.:	No
Cultivation Program Recommedations	
- Cultivation:	No
- Level of difficulty:	Not known
Existing Cultivations:	Not known
- Names of facilities:	
Sources:	Personal observation/ comments: M. P. Nayar Henry, A.N., V. Chitra & N. P. Balakrishnan (1989). *Flora of Tamil Nadu, India* (Ser. 1: Analysis) 3:12; Fischer, C.E.C. (1957). In Gamble, J.S. *Flora of the Presidency of Madras* 3:1003 (Repr.ed.); Cooke, T. (1958). *Flora of the Presidency of Bombay* 3:197 (Repr. ed.) Ahmedulah & M.P. Nayar (1987). *Endemic plants of the Indian region,* Vol. I
Compilers:	Mr. B.V. Shetty, Mr. Purushotham Singh, Dr. S.R. Ramesh, Dr. K. Ravi Kumar, Dr. A.G. Pandurangan, Dr. Ellis, Dr. K.R. Geetha, Ms. Latha

TAXON DATA SHEET

LRNT

Species (& synonyms):	***Garcinia gummi-gutta{L.)*** **Robson** **=** ***G. cambogia*** **(Gaertn.) Desr.**
Family:	Clusiaceae
Taxonomic status:	Species
Habit:	Tree
Habitat:	Semi-evergreen to evergreen
Original Global Distribution:	ENDEMIC to Western Ghats
Current Regional Distribution:	Western Ghats
- Elevation:	50 - 1,800 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	> 2,000
- Number of locations:	Many
Population Trends - % change	
- % Decline:	No decline
- Time / Rate (Yrs or gens):	Not known
- No. of Mature Individuals:	Not known
Global Population:	Not declining
Data Quality:	General field study
Recent Field Studies:	N. Mohanan, 1994-95 in Agastyamalai; N. Anil Kumar, 1992 -93 in Pathanamthitta; V. Chelladurai; C.G. Kushalappa, 1995 in Coorg; Shanawaz Khan, 1995 in southern districts of Kerala: P.S. Udayan, 1995 in Kodanad, Thai Shola: Managalore University, Botany Dept., 1995 in Charmadi, Subramanya and Triveni MPCAs; M.D. Subash Chandran, 1990 -96 in Uttara Kannada evergreen forests: Dr. K. Ravi Kumar, G. S. Goraya and P.S. Udhayan, 1996 in Kudheramukha MPCA
Threats:	Loss of habitat: Harvest for food; Harvest for medicine; Trade
Trade:	Commercial
Other Comments:	Used as condiment in Kerala (fish preparations) as substitute for Tamarind; Rind of fruit upto Rs. 60-70/- per kg. Fruit in trade in high quantity. Need to study effects of harvest of fruits on population structure. Infraspecific classification is not taken into consideration. In U.S. its extracts is used for fat reduction Antiobesity agent (G.G. Gangadaran). Forest Dept. of Kamataka; work on early yielding varities is going on.
Status	
- IUCN:	LOWER RISK-NEAR THREATENED
- Criteria based on:	Not applicable
- -CITES:	No
- -IWPA(1972;91):	No
Recommendations	
- Research management:	Survey; Monitoring; Habitat management
-P.H.V.A.:	Pending results
Cultivation Program Recommendations	
- Cultivation:	Level 1
- Level of difficulty:	Least difficult
Existing Cultivations:	
- Names of facilities:	Karnataka forest department nursery, many homesteads, botanic gardens Arboretum of Mangalore University
Sources:	Personal observation/ comments: N. Mohanan, N. Anil Kumar, V. Chelladurai

Continued next page

C.G. Kushalappa, A.E. Shanawaz Khan,.P.S. Udayan, K. Ravi Kumar, M.D. Subash Chandran
Ramachandran, V.S., & V. J. Natarajan (1988). *Flora of Cannanore*
Singh, N.P. (1993). In Sharma, B.D. & M. Sanjappa (Eds.) *Flora of India* 3: 109.
Salaanha, C.J. (1984). *Flora of Karnataka* 1:205:
Nair, N.C. & A.N. Henry (1983). *Flora of Tamil Nadu, India* (Ser.1 : Analysis) 1:27;
Gamble, J.S. (1957). *Flora of the Presidency of Madras* 1:53 (Repr. ed.);
Cooke, T. (1958). *Flora of the Presidency of Bombay* 1:81 (Repr. ed.).
Rao, R.S: (1985). *Flora of Goa, Diu, Daman, Dadra and Nagarhaveli* 1:29.
Manilal (1988). *Flora of Silent Valley*
Mohanan, N. & A.N. Henry (1994). *Flora of Thiruvananthapuram*
Nair & Nayar (1986). *Flora of Courtallum*
Mathew & Britto in Mathew (1983). *Flora of Tamilnadu Carnatic*

Compilers: Dr. V. Chelladurai, Dr. Keshava Murthy, Mr. G.S. Goraya, Ms. Meera Iyer, Dr. N. Loganathan, Dr. V.S. Ramachandran, Dr. M. Sivadasan

TAXON DATA SHEET

EN

Species (& synonyms):	***Garcinia rubro-echinata Kosterm.*** ***= G. echinocarpa* Gamble**
Family:	Clusiaceae
Taxonomic status:	Species
Habit:	Tree
Habitat:	Evergreen forests
Original Global Distribution:	ENDEMIC to southern Western Ghats
Current Regional Distribution:	Tamil Nadu and Kerala
-Elevation:	900-1,830 m.
- Range (km^2):	< 5,000
- Area Occupied (km^2):	< 500
- Number of locations:	Severely fragmented
Population Trends - % change	
- % Decline:	Not known
- Time / Rate (Yrs or gens):	Not known
- No. of Mature Individuals:	Not known
Global Population:	Restricted distribution
Data Quality:	General field studies
Recent Field Studies:	A.E. Shanawaz Khan, 1994 in Kakachi, Upper Kodayar
Threats:	Trade of parts; Loss of habitat due to fragmentation
Trade:	Local; Domestic; Commercial
Other Comments:	Seed oil is used for illuminating purposes and in soap and candle making. The leaves and bark are used as vermifuge
Status	
- IUCN:	ENDANGERED
- Criteria based on:	Extent of Occurrence (B1, 2c)
- CITES:	No
- -IWPA(1972;91):	No
Recommendations	
-Research management:	Survey; Monitoring
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	Level 1
- Level of difficulty:	Not known
Existing Cultivations:	Not known
- Names of facilities:	--
Sources:	Personal observation/ comments: A.E. Shanawaz Khan Singh, N.P. (1993). In Sharma, B.D. & M. Sanjappa (Eds.). *Flora of India.* 3:123. Mohanan, N. & A.N. Henry (1994). *Flora of Thiruvananthapuram.*
Compilers:	Mr. B.V. Shetty, Mr. Purushotham Singh, Dr. S.R. Ramesh, Dr. K. Ravi Kumar, Dr. A.G. Pandurangan, Dr. Ellis, Dr. K.R. Geetha, Ms. Latha

TAXON DATA SHEET

VU

Species (& synonyms):	***Garcinia talbotir Raizada* ex Santapau** **= *G. ovalifolius* (Roxb.) Hook.f. var. *macrantha* Hook.f.** **= *G. malabarica* Talbot**
Family:	Clusiaceae
Taxonomic status:	Species
Habit:	Tree
Habitat:	Semi-evergreen to evergreen forests
Original Global Distribution:	ENDEMIC to Western Ghats
Current Regional Distribution:	Western Ghats
- Elevation:	Upto 1,000 m.
- Range (km^2):	< 20,000
- Area Occupied (km^2):	< 2.000
- Number of locations:	Few; Fragmented
Population Trends - % change	
- % Decline:	Not known
- Time / Rate (Yrs or gens):	Not known
- No. of Mature Individuals:	Not known
Global Population:	Restricted distribution
Data Quality:	General field studies
Recent Field Studies:	M. D. Subash Chandran, 1986-95 in Uttara Kannada evergreen forests
Threats:	Less of habitat; Harvest for food; Trade
Trade:	Local; Domestic
Other Comments:	Fruits yield inferior quantity of gutta-gum. Dried fruits are used like tamarind in curries.
Status	
- IUCN:	VULNERABLE
- Criteria based on:	Extent of occurence (B1, 2c)
- -CITES:	No
- -IWPA(1972;91):	No
Recommendations	
- Research management:	Survey; Monitoring
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	Level 1
- Level of difficulty:	Not known
Existing Cultivations: - Names of facilities:	None
Sources:	Personal observation/ comments: M.D. Subash Chandran Mohanan, N. & A.N. Henry (1994). *Flora of Thiruvananthapuram.* Singh, N.P. (1993). In Sharma, B.D. & M. Sanjappa (Eds.) *Flora of India* 3: 127; Nair, N.C. & A.N. Henry (1983). *Flora of Tamil Nadu, India* (Ser.1 : Analysis) 1:28; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 1:53 (Repr. ed.); Rao, R. S. (1985). *Flora of Goa, Diu, Daman Dadra and Nagarhaveli* 1:29.
Compilers:	Mr. B.V. Shetty, Mr. Purushotham Singh, Dr. S.R. Ramesh, Dr. K. Ravi Kumar, Dr. A.G. Pandurangan, Dr. Ellis, Dr. K.R. Geetha, Ms. Latha

TAXON DATASHEET

EN

Species (& synonyms):	***Garcinia travancorica* Beddome**
Family:	Clusiaceae
Taxonomic status:	Species
Habit:	Tree
Habitat:	Evergreen shola forests
Original Global Distribution.	ENDEMIC to southern Western Ghats
Current Regional Distribution	Tirunelveli, Kanyakumari hills, Agastyamalai
- Elevation:	above 1,000 m.
- Range (km^2):	< 100
- Area Occupied (km^2):	< 10
- Number of locations:	5 (Tirunelveli, Kanyakumari, Agastyamalai, Ponmudi, Chemurigi)
Population Trends - % change	
- % Decline:	50 %
- Time / Rate (Yrs or gens):	3 generations
- No. of Mature individuals:	< 250
Global Population:	Declining rapidly in highly restricted distribution
Data Quality:	General Field studies; Direct observations
Recent Field Studies:	A.G. Pandurangan and Jose, 1995 -96 in Kerala; K. Ravi Kumar, Gopalan and R. Ganesan, 1990 -96 in Thirunelveli to Agastyarmalai & Kanyakumari; N. Mohanan, 1994-95 in Agastyamalai
Threats:	Harvest for medicine; Human interference; Trade
Trade:	Local
Other Comments:	Immature fruits eaten by squirrels. Being an unisexual tree, fertilization often is difficult leading to low fruitset. No regeneration because of fruits being eaten away. Seeds recalcitrant - Viability period very short Genetic problem (Diseases) - Pollination problematic. Debarking for medicinal purposes. Often bark and fruits collected by tribals
Status	
- IUCN:	ENDANGERED
-Criteria based on:	Population reduction (A1a, 1c); Extent of occurence (B1. 2c); Population estimates (C2a); Number of mature individuals (D)
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Monitoring; Genetic management
-P.H.V.A.:	Yes
Cultivation Program Recommendations	
- Cultivation:	Level 1
- Level of difficulty:	Not known
Existing Cultivations:	
- Names of facilities:	TBGRI, Lalbaugh Garden, Bangalore.
Sources:	Personal observation/ comments: A.G. Pandurangan, K. Ravi Kumar Singh, N.P. (1993). In Sharma, B.D. & M. Sanjappa (Eds.) *Flora of India* 3 128; Nair, N.C. & A.N, Henry (1983). *Flora of Tamil Nadu. India* (Ser.1 : Analysis) 1:28; Gamble, J.S. 1957. *Flora of the Presidency of Madras* 1:53 (Repr. ed); Mohanan & Henry (1994) *Flora of Thiruvananthapuram*
Compilers:	Mr. B.V. Shetty, Mr. Purushotham Singh, Dr. S.R. Ramesh, Dr. K Ravi Kumar, Dr. A.G. Pandurangan, Dr. Ellis, Dr. K.R. Geetha, Ms. Latha

TAXON DATASHEET

EN

Species (& synonyms):	***Gymnema khandalense* Santapau**
Family:	Asclepiadaceae
Taxonomic status:	Species
Habit:	A large woody climber
Habitat:	Moist deciduous
Original Global Distribution:	ENDEMIC to Western Ghats
Current Regional Distribution:	Western Ghats
- Elevation:	+/- 550 m.
- Range (km^2):	< 20,000
- Area Occupied (km^2):	<500
- Number of locations:	3 in Maharashtra and 1 in Kerala; Fragmented
Population Trends - % change	
- % Decline:	Not known
- Time / Rate (Yrs or gens):	Not known
- No. of Mature Individuals:	Not known
Global Population:	Restricted area of occupancy
Data Quality:	General field study (Santapau and Irani 1962 in Maharashtra)
Recent Field Studies:	Swarupanandan, 1991 in Kerala
Threats:	Harvest for medicine; Trade
Trade:	Domestic; Commercial
Other Comments:	Used as a substitute for *G. sylvestre.* Swarupanandan has reported very few plants and there is no information on population from Maharashtra
Status	
-IUCN:	ENDANGERED
- Criteria based on:	Extent of occurrence (B1, 2c, 2d)
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Survey; Monitoring
-P.H.V.A.:	Yes
Cultivation Program Recommendations	
- Cultivation:	Pending results
- Level of difficulty:	Not known
Existing Cultivations:	None
- Names of facilities:	--
Sources:	*Red Data Book - Maharashtra* (Pune dist.; Khandala; Raigad; Masadi forests in Roha) Santapau & Irani (1962) Kothari, M.J. (1990). In Nayar, M.P. and A.R.K. Sastry (Eds.), *Red Data Book of Indian Plants* 3:37
Compilers:	Dr. P. Venu, Mr. P.S. Udayan, Ms. Noorunissa Begum, Mr. A.E. Shanawaz Khan, Mr. D.K. Ved, Dr. P. Subramani, Ms. Caroline Priya, Dr. C.G. Kushalappa

TAXON DATA SHEET

EN

Species (& synonyms):	***Gymnema montanum* (Roxb.) Hook.f. var. *montanum***
Family:	Asclepiadaceae
Taxonomic status:	Variety
Habit:	Climber
Habitat:	Semi-evergreen to evergreen
Original Global Distribution:	ENDEMIC to Western Ghats
Current Regional Distribution:	Western Ghats
- Elevation:	1,300 to 2,000 m.
- Range (km^2):	< 5,000
- Area Occupied (km^2):	< 500
- Number of locations:	4 (Shimoga, Silent Valley - Mukkali Camp Shed, Naduvattam, Anamalai); Fragmented
Population Trends - % change	
- % Decline:	Not known
- Time / Rate (Yrs or gens):	Not known
- No. of Mature Individuals:	Not known
Global Population:	Restricted distribution
Data Quality:	General field study (K.S. Manilal, 1988, S.N. Yoganarasimhan, 1986)
Recent Field Studies:	None
Threats:	Overexploitation; Trade for parts; Harvest for medicine
Trade:	Domestic; Commercial
Other Comments:	Used as a substitute for *G. sylvestre.*
Status	
- IUCN:	ENDANGERED
- Criteria based on:	Extent of occurence (B1, 2c)
- -CITES:	No
- -IWPA(1972;91):	No
Recommendations	
- Research management:	Survey; Monitoring
-P.H.V.A.:	Yes
Cultivation Program Recommendations	
- Cultivation:	Pending further data
- Level of difficulty:	Not known
Existing Cultivations:	None
- Names of facilities:	
Sources:	Personal observation/ comments: S.N. Yoganarasimhan Henry, A.N., G.R. Kumari & V. Chitra (1987). *Flora of Tamil Nadu, India* 2:85; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 2:590 (Repr. ed.); Cooke, T 1958. *Flora of the Presidency of Bombay* 2:225; Sharma, B.D. *et a*l., *Biol. Mem.* (Angiosperm Taxonomy Ser. -1) p.91. Manilal (1988). *Flora of Silent Valley*
Compilers:	Dr. P. Venu, Mr. P.S. Udayan, Ms. Noorunissa Begum, Mr. A.E. Shanawaz Khan, Mr. D.K. Ved, Dr. P. Subramani, Ms. Caroline Priya, Dr. C.G. Kushalappa

TAXON DATA SHEET

EN-R

Species (& synonyms):	***Helminthostachys zeylanicus* (L.) Hook.** **= *H. dulcis* Kaulf.**
Family:	Ophioglossaceae
Taxonomic status:	Species
Habit:	Herb
Habitat:	Swamps and marshy places; Cool forest floors upto 1000 m.
Original Global Distribution:	Indo-Malaysia, Australia
Current Regional Distribution:	Peninsular India (Kerala & Tamil Nadu)
- Elevation:	upto 1,000 m.
- Range (km^2):	< 5,000
- Area Occupied (km^2):	< 100
- Number of locations:	Few; Fragmented
Population Trends - % change	
- % Decline:	30 %
- Time / Rate (Yrs or gens):	10 years
- No. of Mature Individuals:	Not known
Global Population:	Not known
Regional Population:	Declining in its restricted range and area
Data Quality:	General field study
Recent Field Studies:	A.G. Pandurangan & A.E. Shanawaz Khan, 1995-96 in Mallappuram, Kollam, Nelambur, Coimbatore and Triveni; V. Chelladurai, 1995-96 in Peechiparai.
Threats:	Harvest for food; Harvest for medicine; Trade of parts for medicine (roots); Human interference(for botanical collections)
Trade:	Local; Domestic; Commercial
Other Comments:	Fronds eaten as raw or cooked by Malayans and Kattnayakans of Kerala. Used as a Tonic, controls dysentry and antidote for snake poison. Fresh roots are sold at Rs. 30/ kg. in local market. Work on its nutritive analysis per 100 gm. (Ca = 97.95 mg, P = 91.50 mg., Fe = 1.79 mg. Carotene = 2.1 mg. Vit. C = 45.90 mg.) CFTRI. Collected due to its botanical interest
Status	
- IUCN:	ENDANGERED (Regionally) DATA DEFICIENT (Globally)
- Criteria based on:	Extent of occrrence (B1, 2c)
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Survey; Monitoring
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	Level 1
- Level of difficulty:	Not known
Existing Cultivations:	
- Names of facilities:	TBGRI
Sources:	Personal observation/ comments: A.G. Pandurangan, A.E. Shanawaz Khan, V. Chelladurai
Compilers:	Mr. B.V. Shetty, Mr. Purushotham Singh, Dr. S.R. Ramesh, Dr. K. Ravi Kumar, Dr. A.G. Pandurangan, Dr. Ellis, Dr. K.R. Geetha, Ms. Latha

TAXON DATA SHEET

VU

Species (& synonyms):	***Heracleum candolleanum* (Wight & Am.) Gamble**
Family:.	Apiaceae
Taxonomic status:	Species
Habit:	Perennial herb
Habitat:	Montane Shola grasslands
Original Global Distribution:	ENDEMIC to southern Western Ghats and Kolli Hills
Current Regional Distribution:	Karnataka, Tamil Nadu and Kerala
-Elevation:	1,500-2,000 m.
- Range (km^2):	< 20,000
- Area Occupied (km^2):	< 2,000
- Number of locations:	Many, Fragmented
Population Trends - % change	
- % Decline:	20 %
- Time / Rate (Yrs or gens):	10 years
- No. of Mature Individuals:	Not known
Global Population:	Declining gradually
Data Quality:	General field studies
Recent Field Studies:	A.G. Pandurangan, A.E. Shanawaz Khan, 1995 -96 in Agastyamalai; N. Mohanan, 1994-95 in Agastyamalai; K. Ravi Kumar, 1994-95 in Kodaikanal; M.B. Vishwanathan, 1993 in Kolli Hills; P.S. Udayan, 1996 in Pykara; A.E. Shanawaz Khan, 1994 in Agastyamalai, Munnar
Threats:	Harvest for medicine; Loss of habitat; Trade
Trade:	Commercial
Other Comments:	Whole plant dried and sold to Ayurvedic Industry. Used as substitute for *H. rigens.* Seeds are in trade, tuber collected by local health pracitioners
Status	
- IUCN:	VULNERABLE
- Criteria based on:	Population reduction (A1a,1c,1d), Extent of occurrence (B1, 2c)
- CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Monitoring; Habitat management
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	No
- Level of difficulty:	Very difficult (high altitude specific)
Existing Cultivations:	None
- Names of facilities:	
Sources:	Personal observation/comments: A.G. Pandurangan, A.E. Shanawaz Khan, K. Ravi Kumar, M.B. Vishwanathan, P.S. Udayan Saldanha, C.J. (1996). *Flora of Karnataka* 1:280; Nair, N.C. & A.N. Henry (1983). *Flora of Tamil Nadu, India* 1:179; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 1:399 (Repr. ed.) Mathew, K.M. (1983). *Flora of Tamil Nadu Carnatic.* Vol. 1, P. 680 Nair, N.C. & A.N. Henry (1983). *Flora of Tamil Nadu,* Vol. I, Dist. Coimbatore, Kanyakumari, Madurai & Nilgiri
Compilers:	Mr. B.V. Shetty, Mr. Purushotham Singh, Dr. S.R. Ramesh, Dr. Ravi Kumar, Dr. A.G. Pandurangan, Dr. Ellis, Dr. K.R. Geetha, Ms. Latha

TAXON DATA SHEET

VU-R

Species (& synonyms):	***Heracleum rigens* Wallich ex DC.**
Family:	Apiaceae
Taxonomic status:	Species
Habit:	Herb
Habitat:	Bare slopes
Original Global Distribution:	Peninsular India and Sri Lanka
Current Regional Distribution:	Peninsular India (Karnataka and Tamil Nadu)
-Elevation:	1,200-2,630 m.
- Range (km^2):	< 20,000
- Area Occupied (km^2):	< 2,000
- Number of locations:	10; Fragmented
Population Trends - % change	
- % Decline:	Not known
- Time / Rate (Yrs or gens):	Not known
- No. of Mature Individuals:	Not known
Global Population:	Not known
Regional Population:	Gradually declining
Data Quality:	General field study
Recent Field Studies:	M.B. Vishwanathan, 1992 -93 in Kolli Hills; P.S. Udayan, 1993 in Mukurthi
Threats:	Trade of parts (seeds)
Trade;	Local
Other Comments:	Used in Ayurveda as Sukshma Ela and in Sidda medicine as Chittralam. Seeds collected.
Status	
-IUCN:	VULNERABLE (Regionally); DATA DEFICIENT (Globally)
- Criteria based on:	Extent of occurence (B1, 2c)
- CITES:	No
- IWPA(1972;91):	No
Recommendations	
-Research management:	Survey:
Monitoring	
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	No
- Level of difficulty:	Not known
Existing Cultivations:	None
-Names of facilities:	
Sources:	Personal observation/ comments: M.B. Vishwanathan, P.S. Udayan Saldanha, C.J. (1996). *Flora of Karnataka* 2:280; Nair, N.C. & A.N. Henry (1983). *Flora of Tamil Nadu, India* 1:179; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 1:398; Matthew, K.M. (1991). *An Excursion Flora of Central Tamil Nadu, India,* p. 225. Mathew (1983). *Flora of Tamilnadu Carnatic,* Vol. 3, P. 681 Manilal (1988). *Flora of Silent Valley* Nair, N.C. & A.N. Henry (1983). *Flora of Tamil Nadu,* Vol. I, Dist. Coimbatore, Kanyakumari, Madurai & Nilgiri, Tirunelveli, Dharmapuri, Salem
Compilers:	Mr. B.V. Shetty, Mr. Purushotham Singh, Dr. S.R. Ramesh, Dr. K. Ravi Kumar, Dr. A.G. Pandurangan, Dr. Ellis, Dr. K.R. Geetha, Ms. Latha

TAXON DATA SHEET

EN

Species (& synonyms):	***Humboldtia vahliana* Wight**
Family:	Caesalpiniaceae
Taxonomic status:	Species
Habit:	Tree
Habitat:	Evergreen along river banks/beds
Original Global Distribution:	ENDEMIC to southern Western Ghats
Current Regional Distribution:	Tamil Nadu and Kerala
- Elevation:	upto 1,000 m.
- Range (km^2):	< 20,000
- Area Occupied (km^2):	< 500
- Number of locations:	7; Fragmented
Population Trends % change:	
- % Decline:	20 %
- Time / Rate (Yrs or gens):	3 generations
- No. of Mature Individuals:	Not known
Global Population:	Declining gradually in its restricted range
Data Quality	General field study
Recent Field Studies	A.G. Pandurangan from Pamba (Triveni) MPCA; N. Anil Kumar, 1992-93 in Pathanamthitta
Threats (Key):	Harvest for medicine; Trade of parts for medicine (bark)
Trade:	Domestic
Other Comments:	Bark collected for use in medicine.
Status	
- IUCN:	ENDANGERED
- Criteria based on:	Extent of occurrence (B1, 2c)
- CITES:	No
- -IWPA(1972;91):	No
Recommendations	
- Research management:	Monitoring
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	No
- Level of difficulty:	Not known
Existing Cultivations:	None
- Names of facilities:	--
Sources:	Personal observation/ comments: A.G. Pandurangan, N. Anil Kumar Nair, N. E. & A.N. Henry. (1983). *Flora of Tamil Nadu, India.* (Ser.1: Analysis) 1:132; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 1:291 (Repr. ed.) Baker (1878). In Hook. F, *Flora of British India* 2:272 Nair, N. E. & A.N. Henry. (1983). *Flora of Tamil Nadu,* Vol. I, Distribution : Nilgiri & Tirunelveli
Compilers:	Mr. B. V. Shetty, Mr. Purushotham Singh, Dr. S. R. Ramesh, Dr. K. Ravi Kumar, Dr. A. G. Pandurangan, Dr. Ellis, Dr. K. R. Geetha, Ms. Latha

TAXON DATA SHEET

EN -R

Species (& synonyms):	***Hydnocarpus alpina* Wight**
Family:	Flacourtiaceae
Taxonomic status:	Species
Habit:	Tall Tree (10-30 m.)
Habitat:	Evergreen forest; found along steam banks; moist valleys
Original Global Distribution:	Southern Western Ghats & Sri Lanka
Current Regional Distribution:	Southern Western Ghats
- Elevation:	upto 2,000m
- Range (km^2):	> 20,000
- Area Occupied (km^2):	< 2,000
- Number of locations:	Many
Population Trends - % change in years or gens.	
- % Decline:	> 50 %s
- Time / Rate (Yrs or gens):	3 generations
- No. of Mature individuals:	Not known
Global Population:	Not known
Regional Population:	Declining rapidly
Data Quality	General field studies
Recent Field Studies	S. Armougame, 1996 Botanical Survey in Walayar; Olacocode, Attapady Chenata Nagar - Forest ranges; PS. Udayan, 1995 in Dolphinos, Lamps rock. Kodanad; N. Mohanan. 1994-95 in Agastyamalai
Threats (Key):	Loss of habitat; Loss of habitat because of fragmentation, Trade of parts medicine (fruits); Overexploitation; Harvest for medicine
Trade:	Commercial
Other Comments:	Substitute for *Hydnocarpus pentandra.* Trade in fruits for oil extraction heavy. The Flora of India treats this species as Endemic to southern Western Ghats. According to Saldanha (1984) it is distributed in Western Ghats and Sri Lanka
Status	
- IUCN:	ENDANGERED (Regionally); DATA DEFICIENT (Globally)
- Criteria based on:	Population reduction (A1a, 1c, 1d)
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Survey - search and find; Habitat management, Life history studies; Limiting factor research; Monitoring; Taxonomic studies
-P.H.V.A.:	Pending
Cultivation Program Recommendations	
- Cultivation:	Reforestation
- Level of difficulty:	Moderately difficult
Existing Cultivations:	
- Names of facilities:	Not known

Continued next page

Hydnocarpus alpina continued

Sources:	Personal observation/ comments: S. Armougame, P.S. Udayan Fyson's flora; *British India; Karnataka, Trivandrum floras & Palaghat* Mitra, R. H. (1993). *In Sharma, B.D. and N.P. Balakrishnan, Flora of India* 2:418: Saldanha, C.J. (1984). *Flora of Karnataka* 1:272; Nair, N.C. & A. N. Henry. (1983). *Flora of Tamil Nadu, India* (Ser. 1: Analysis) 1:18; Vajravelu, E. (1990). *Flora of Palakkad District,* p. 61. Gamble, J.S. (1957). *Flora of the Presidency of Madras* 1:37 Nair, N.C. & Nayar, M.P. (1986). *Flora of Courtallam* Manilal (1988). *Flora of Silent Valley* Mohanan, N. & A.N. Henry (1994). *Flora of Thiruvananthapuram* Nair, N.C. & A. N. Henry. (1983). *Flora of Tamil Nadu,* Vol. I, Distribution : Coimbatore, Madurai & Nilgiri
Compilers:	Dr. M.P Nayar, Dr. M. D. Subash Chandran, Dr. S.N. Yoganarasimhan, Mr. A. Kareem, Dr. M.B. Vishwanath, Mr. Vinay Tandon, Mr. S. Armougame, Dr. S.S.R. Bennet

TAXON DATA SHEET

VU

Species (& synonyms):	***Hydnocarpus pentandra* (Buch. - Ham.) Oken** ***=H. laurifolia* (Dennst.)**
Family:	Flacourtiaceae
Taxonomic status:	Species
Habit:	Tree
Habitat:	Moist deciduous to semi-evergreen forest
Original Global Distribution:	ENDEMIC to Western Ghats
Current Regional Distribution:	Western Ghats
- Elevation:	upto 850 m
- Range (km^2):	> 20,000
- Area Occupied (km^2):	> 2,000
- Number of locations:	Not known
Population Trends - % change	
- % Decline:	> 20 %
- Time / Rate (Yrs or gens):	3 generation
- No. of Mature Individuals:	Not known
Global Population:	Declining gradually
Data Quality	General field study
Recent Field Studies	K.V. Devar, Botanical survey of Devimane MPCA; A.E. Shanawaz Khan in Trivandrum district and Pathanamthitta dist., Kudremukha and Charmadi; V.S. Ramachandran, 1995 in Topslip and Courtallam MPCA: Keshava Murthy in Patoli, Uttara Kannada; Mangalore University, Botany Dept., 1995 in Subramanya MPCA; C.G. Kushalappa, 1996-97 in Kunda, Makut in Coorg; S. Armougame, 1996 collected in Chenat Nayar, Adupukooti Malai, Palakkad; N. Anil Kumar, 1992-93 in Pathanamthitta;
Threats (Key):	Loss of habitat because of fragmentation; Harvest for medicine; Trade Overexploitation; Predation
Trade:	Commercial
Other Comments:	Monkeys and Squirrel eat immature seeds. Seed are harvested for Chaalomogra oil used in cure of leprosy.
Status	
- IUCN:	VULNERABLE
- Criteria based on:	Population reduction (A1a, 1c, 1d)
- CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Monitoring; Life history studies
- P.H.V.A.:	Yes
Cultivation Program Recommendations	
- Cultivation:	Level 1
- Level of difficulty:	Least difficult
Existing Cultivations:	
- Names of facilities:	Arboretum of Mangalore University; *Ex situ* Conservation, CIMH, MPCP

Hydnocarpus pentandra continued

Sources:	Personal observation/comments:A.E. Shanawaz Khan, C.G. Kushalappa. V. S. Ramachandran, N. Anil Kumar, Keshava Murthy, S. Armougame Mitra, R. H. (1993). *In Sharma, B.D. and N.P. Balakrishnan. Flora of India* 2:422: Saldanha, C.J. (1984). *Flora of Karnataka* 1:272: Nair, N.C. & A. N. Henry. 1983. *Flora of Tamil Nadu, India* (Ser. 1: Analysis) 1:19; Vajravelu, E. 1990. *Flora of Palakkad District,* p. 61." Gamble, J.S. 1957. *Flora of the Presidency of Madras* 1:37 Ramachandran, V.S. & V.J. Nair (1988). *Flora of Cannanore* Vajravelu, E. (1990). *Flora of Palakkad & Thiruvananthapuram Distribution* : Coimbatore, Madurai & Nilgiri Hook, F. (1872). *Flora of British India* Ramamurthy (1976). In Saldanha & Nicols, *Flora of Hasan Dist.,*
Compilers:	Dr. P. Venu, Mr. P.S. Udyan, Ms. Noorunissa Begum, Mr. A.E. Shanawaz Khan. Mr. D.K. Ved, Dr. P. Subramani, Ms. Caroline Priya, Dr. C.G. Kushalappa

TAXON DATA SHEET

LRNT

Species (& synonyms):	***Knema attenuata* (Wallich ex Hook. f. & Thorns.) Warb.** **= *Myristica attenuata* Wallich ex Hook. f. & Thoms.**
Family:	Myristicaceae
Taxonomic status:	Species
Habit:	Medium Tree
Habitat:	Evergreen forests and also semi-evergreen
Original Global Distribution:	ENDEMIC to Western Ghats
Current Regional Distribution:	Western Ghats
- Elevation:	upto 800 m.
- - Range (km^2):	> 20.000
- Area Occupied (km^2):	> 2.000
- Number of locations:	Many
Population Trends - % change	
- % Decline:	< 20 %
- Time / Rate (Yrs or gens):	2 generations
- No. of Mature Individuals:	Not known
Global Population:	Declining generally
Data Quality	General field studies; Informal field sightings
Recent Field Studies	S. Armougame, 1994 Survey in Anamalai; M.D. Subash Chandran observation and quantity estimation studies in Uttara Kannada; Keshava Murthy in Uttara Kannada; V.S. Ramachandran, 1994 in Topslip; P.S. Udayan, 1996 in Kudremukh and Subramanya MPCA. C.G. Kushalappa, 1996 in Coorg; N. Anil Kumar, 1992-93 in Pathanamthitta; N. Mohanan, 1994-95 in Agastya-malai
Threats (Key):	Loss of habitat; Harvest; Trade
Trade:	Domestic; Commercial
Other Comments:	The population decline is estimated as less than 20% due to high representation of the species and its relative abundance in riverine tracts. Wood for match boxes. N.M. Kurien in Spices Board has studied the reproductive biology of the species.
Status	
- IUCN:	LOWER RISK - NEAR THREATENED
- Criteria based on:	Not applicable
- CITES:	No
- IWPA(1972;91):	No
Recommendations	
- Research management:	Habitat management
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	No
- Level of difficulty:	Not known
Existing Cultivations:	
- Names of facilities:	Arboretum of Mangalore University

Knema attenuata continued

Sources:	Personal observation/ comments: S. Armougame, M.D. Subash Chandran, Keshava Murthy, V.S. Ramachandran, P.S. Udayan, C.G. Kushalappa Saldanha, C.J. (1984). *Flora of Karnataka* 1:53; Henry, A.N., G.R. Kumari & V. Chitra (1987). *Flora of Tamil Nadu, India* 2:205; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 2:851 (Repr. ed.); Cooke, T. (1958)r *Flora of the Presidency of Bombay* 3:24(Repr. ed.); Yoganarasimhan, S.N., K. Subramanyam & B.A. Razi (1981). *Flora of Chikmagalur Dist., Karnataka, India,* p.277; Vajravelu, E. (1990). *Flora of Palakkad Dist.,* p. 400 Gandhi (1976). In Saldhanha & Nicols., *Flora of Hasan Dist,* Mohanan, N. & A.N. Henry (1994). *Flora of Thiruvananthapuram*
Compilers:	Dr. M. P. Nayar, Dr. M.D. Subash Chandran, Dr. S.N. Yoganarasimhan Mr. A. Kareem, Dr. M.B. Vishwanath, Mr. Vinay Tandon, Mr. S. Armougame, Dr. S.S.R. Bennet

TAXON DATA SHEET

DD

Species {& synonyms):	***Luffa umbellata* Klein ex Willd. Roemer**
Family:	Cucurbitaceace
Taxonomic status:	Species
Habit:	Climber
Habitat:	Edges of evergreen forest along foothills
Original Global Distribution:	ENDEMIC to southern Western Ghats
Current Regional Distribution:	Southern Western Ghats
- Elevation:	upto 1,000 m.
- Range (km^2):	< 5,000
- Area Occupied (km^2):	< 500
- Number of locations:	Very few
Population Trends - % change	
- % Decline:	Not known
- Time / Rate (Yrs or gens):	Not known
- No. of Mature Individuals:	Not known
Global Population:	Restricted distribution but trends not known.
Data Quality	General field studies
Recent Field Studies	November 1996, field survey in Anavail, Attapady
Threats (Key):	Not known
Trade:	Not known
Other Comments:	
Status	
-IUCN:	DATA DEFICIENT
- Criteria based on:	Not applicable
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Survey; Taxonomic and genetic studies
Cultivation Program Recommendations	
- Cultivation:	No
- Level of difficulty:	Not known
Existing Cultivations:	None
- Names of facilities:	
Sources:	Chakravarty, H.L. (1982). Cucurbitaceae. *Fascietes of Flora of India* 11:75; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 1:377 (Repr. ed.)
Compilers:	Dr. M.P. Nayar, Dr. M.D. Subash Chandran, Dr. S.N. Yoganarasimhan, Mr. A. Kareem, Dr. M.B. Vishwanathan, Mr. Vinay Tandon, Mr. S. Armougame, Dr. S.S.R. Bonnet

TAXON DATA SHEET

EN-R

Species (& synonyms):	***Madhuca longifolia var. longifolia (Koering) Macbr.*** ***= Bassia longifolia Koering***
Family:	Sapotaceae
Taxonomic status:	Species
Habit:	Large Tree
Habitat:	Deciduous and mixed forests
Original Global Distribution:	Indo-Malayasia
Current Regional Distribution.	Southern India
- Elevation:	upto 1000 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	> 2,000
- Number of locations:	Many
Population Trends - % change	
- % Decline:	> 50 %
- Time / Rate (Yrs or gens):	3 generations
- No. of Mature Individuals:	Not known
Global Population:	Not known
Regional Population:	Declining rapidly
Data Quality	General field studies; Information field sightings (M.B. Vishwanathan,1984)
Recent Field Studies	S. Armougame, K. Ravi Kumar, 1980-97; M.B. Vishwanathan, 1994-96; P.S. Udayan, Oct. 1996 in Charmadi; A.E. Shanawaz Khan, 1994-96 in Thiruvananthapuram semi-evergreen forests; S. Armougame, 1996 in Attapady; N. Anil Kumar, 1992-93 in Pathanamthitta
Threats (Key):	Loss of habitat; Harvest for medicine; Overexploitation; Harvest for timber; Browsing & grazing; Trade
Trade:	Domestic; Commercial
Other Comments:	Flowers for brewing arrack, oil got from seeds, wood as structural timber
Status	
- IUCN:	ENDANGERED (Regionally); DATA DEFICIENT (Globally)
- Criteria based on:	Population reduction (A1a, 1c, 1d)
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Habitat management; Life history studies; Afforestation
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	Level 1
- Level of difficulty:	Least difficult
Existing Cultivations:	As avenue trees
- Names of facilities:	Not known
Sources:	Personal observation/ comments: S. Armougame, K. Ravi Kumar, M.B. Vishwanathan Saldanha, C.J. (1984). *Flora of Karnataka* 1:329; Matthew, K.M. (1991). *An Excursion Flora of Central Tamil Nadu, India,* p. 278; Rao, R.S. (1986). *Flora of Goa, Diu, Daman, Dadra and Nagarhaveli* 2:244; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 2:537 (Repr. ed.); Cooke, T. (1958). *Flora of the Presidency of Bombay* 2:152 (Repr. ed.); Henry, A.N., G.R. Kumari & V. Chitra. (1987). *Flora of Tamil Nadu, India* (Ser.1: Analysis) 2:63. Ramamurthy (1976). In Saldanha & Nicols., *Flora of Hasan Dist.,* Mathew & Ravi (1983). In Mathew, *Flora of Tamil Nadu Carnatic*
Compilers:	Dr. M.P. Nayar, Dr. M.D. Subash Chandran, Dr. S.N. Yoganarasimhan, Mr. A. Kareem, Dr. M.B. Vishwanathan, Mr. Vinay Tandon, Mr. Armougame, Dr. S.S.R. Bennet

TAXON DATA SHEET

VU-R

Species (& synonyms):	***Madhuca neriifolia (Moon) H.* J. Lam.** **= *Bassia malabarica* Beddome**
Family:	Sapotaceae
Taxonomic status:	Species
Habit:	Tree
Habitat:	Along water courses in semi-evergreen and evergreen forest
Original Global Distribution:	Peninsular India & Sri Lanka
Current Regional Distribution:	Peninsular India
- Elevation:	upto 700 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	> 2,000 '
- Number of locations:	Many
Population Trends - % change	
- % Decline:	20 %
- Time / Rate (Yrs or gens):	10 Years
- No. of Mature individuals:	Many
Global Population:	Not known
Regional Population:	Declining gradually
Data Quality	Informal field sightings
Recent Field Studies	K. Ravi Kumar's personal collections, 1995 -97 from Tirunelvelli, Kanyakumari & Charmadi, Subramanya MPCA; S. Armougame, 1994 collected in Waragaliar, Top Slip; N. Anil Kumar, 1992-93 in Pathanamthitta; N. Mohanan, 1994-95 in Agasthyamalai: M.D. Subash Chandran, 1996 in Uttara Kannada
Threats (Key):	Loss of habitat; Harvest for medicine; Trade
Trade:	Local; Domestic
Other Comments:	Heart wood decoction used for ulcers. Flowers soaked in water used for kidney complaints. Heart wood used for making country mortars. According to Gamble the species occurs upto an elevation of 1200 m.
Status	
- IUCN:	VULNERABLE (Regionally); DATA DEFICIENT (Globally)
- Criteria based on:	Population reduction (A1c)
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Survey; Monitoring; Habitat management
-P.H.V.A.:	Pending results
Cultivation Program Recommendations	
- Cultivation:	No
- Level of difficulty:	Not known
Existing Cultivations:	Not known
- Names of facilities:	*Ex situ* Conservation, CIMH, MPCP
Sources:	Personal observation/ comments: K. Ravi Kumar, N. Anil Kumar, S. Armougame, M.D. Subash Chandran Saldanha, C.J. (1984). *Flora of Karnataka* 1:331; Henry, A.N., G.R. Kumari & V. Chitra (1987). *Flora of Tamil Nadu, India* (Ser.1: Analysis) 2:63. Gamble, J.S. (1957). *Flora of the Presidency of Madras* 2:537 (Repr. ed.); Cooke, T. (1958). F/ora *of the Presidency of Bombay* 2:153 (Repr. ed.);
Compilers:	Dr. V. Chelladurai, Dr. Keshava Murthy, Mr. S.S. Goraya, Ms. Meera Iyer, Dr. N. Loganathan, Dr. V.S. Ramachandran, Dr. M. Sivadasan

TAXON DATA SHEET

VU-R

Species (& synonyms):	***Michelia nilagirica Zenk.***
Family;	Magnoliaceae
Taxonomic status:	Species
Habit:	Tree
Habitat:	Ever-green to shola forest
Original Global Distribution:	Western peninsular India and Sri Lanka (Hooker)
Current Regional Distribution:	Western peninsular India
- Elevation:	Above 1,300 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	> 2.000
- Number of locations:	Not known
Population Trends - % change	
- % Decline:	> 20 %
- Time / Rate (Yrs or gens):	3 generations
- No. of Mature Individuals:	Not known
Global Population:	Not known
Regional Population:	Declining gradually
Data Quality	General field study (K. Ravi Kumar, 1985-89 in Madurai and Nilgiris)
Recent Field Studies	P.S. Udayan, 1996 in Pykara, Kottagiri, Doddabetta; N. Sasidharan, 1995 in Eravikulam; S.N. Yoganarasimhan. 1974 in Bababudangiri, Shankar Falls, Kemmangundi. Dr. V.S. Ramachandran. 1994 in Kodaikanal MPCA
Threats (Key):	Loss of habitat
Trade:	No
Other Comments:	
Status	
- iUCN:	VULNERABLE (Regionally); DATA DEFICIENT (Globally)
- Criteria based on:	Population reduction (A1a, 1c)
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Monitoring; Habitat management
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	Level 1
- Level of difficulty:	Moderately difficult
Existing Cultivations:	None
- Names of facilities:	--
Sources:	Personal observation/comments: K. Ravi Kumar, P.S. Udayan, N. Sasidharan, S.N. Yoganarasimhan; V.S. Ramachandran Hooker, *Flora of British India;* Saldanha, C.J. (1984). *Flora of Karnataka* 1:39; Nair, N.C. & A.N. Henry (1983). *Flora of Tamil Nadu, India* (Ser.1: Analysis) 1:3.; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 1:7 (Repr. ed.) Ramamurthy (1976). In Saldanha & Nicols., *Flora of Hasan Dist,* Mohanan, N. & A.N. Henry (1994). *Flora of Thiruvananthapuram* Yoganarsimhan, S.N. *Flora of Chikmagalur Dist.,* Ravi Kumar, K. (1990). Ph.D. Thesis
Compilers:	Dr. V Chelladurai, Dr. Keshava Murthy, Mr. S.S. Goraya, Ms. Meera Iyer, Dr. N. Loganathan, Dr. V.S. Ramachandran, Dr. M. Sivadasan

TAXON DATA SHEET

VU-R

Species (& synonyms):	***Myristica dactyloides* Gaertner** ***= M. beddomei King*** ***= M. contorts* Warb**
Family:	Myristicaceae
Taxonomic status:	Species
Habit:	Tree
Habitat:	Evergreen forest
Original Global Distribution:	Southern India and Sri Lanka
Current Regional Distribution:	Southern India
- Elevation:	> 1,300 m. (Eastern Ghats): Upto 1500 m. (Western Ghats)
- - Range (km^2):	> 20,000
- Area Occupied (km^2):	> 2,000
- Number of locations:	
Population Trends - % change	
- % Decline:	> 20 %
- Time / Rate (Yrs or gens):	3 generations
- No. of Mature Individuals:	Not known
Global Population:	Not known
Regional Population:	Declining gradually
Data Quality	General field studies
Recent Field Studies	P.S. Udayan, Noorie & Priya, Oct. 1996 & Aug. 1996 in Botanical Survey of India, Charmadi MPCA & in Aug. 1996 in Subramanya MPCA; Shanwaz Khan in Thiruvananthapuram district, Agastyamalai, Pandimotta; M.B. Vishwanath, 1994 in Kolli Hills; N. Sasidharan, 1994 in Silent Valley; K.V. Devar, 1995 in Kemmanagundi: C. Renuka, 1994 in Wyanad; S. Armougame, 1996 in Senthamarikulam forest in Walayar Range, Olavakot Range, Silent Valley and Agalai Range; M. B. Vishwanathan, 1992-96 in Kolli Hills; N. Anil Kumar, 1992-93 in Pathanamthitta; Mangalore University, Botany Dept.. 1995 in Charmadi and Subramanya MPCAs : C.G. Kushalappa. 1997 in Udumbe; VS. Ramachandran, 1995 in Topslip; N. Mohanan, 1994-95 in Agastyamalai; K. Ravi Kumar, 1983-95 in Madurai, Megamalai & Top Slip in Coimbatore
Threats (Key):	Harvest for medicine; Overexploitation; Trade
Trade:	Commercial
Other Comments:	Aril of *M. dactyloides* used an substitute for *M. fragrans*
Status	
- IUCN:	VULNERABLE (Regionally); DATA DEFICIENT (Globally)
- Criteria based on:	Population reduction (A1a, 1c, Id)
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Monitoring; Sustainable harvest
- P.H.V.A.:	Yes
Cultivation Program Recommendations	
- Cultivation:	Pending results
- Level of difficulty:	Not known
Existing Cultivations:	
- Names of facilities:	Arboretum of Mangalore University

Continued next page

Myristica dactyloides continued

Sources:	Personal observation/ comments: P.S. Udayan, Noorie, Priya, Shanwaz Khan, M.B. Vishwanathan, C. Renuka, S. Armougame, N. Anil Kumar, V.S. Ramachandran, C.G. Kushalappa, N. Sasidharan Saldanha, C.J. (1984). *Flora of Karnataka* 1:54: Matthew, K.M. (1991). *An Excursion Flora of Central Tamil Nadu, India,* p. 431; Henry, A.N., G.R. Kumari & V. Chitra (1987). *Flora of Tamil Nadu, India* (Ser.1: Analysis) 2:205; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 2:850 (Repr. ed.); Cooke, T. (1958). *Flora of the Presidency of Bombay* 3:23 (Repr. ed.). Ramachandran, V.S. & V.J. Nair (1988). *Flora of Cannanore* Gandhi (1976). In Saldanha & Nicols., *Flora of Hasan Dist,* Mathew & Ravi (1983). In Mathew, *Flora of Tamil Nadu Carnatic* Mohanan, N. & A.N. Henry (1994). *Flora of Thiruvananthapuram*
Compilers:	Mr. B. V. Shetty, Mr. Purushotham Singh, Dr. S. R. Ramesh, Dr. K. Ravi Kumar, Dr. A. G. Pandurangan. Dr. Ellis, Dr. K. R. Geetha, Ms. Latha

TAXON DATA SHEET

VU-R

Species (& synonyms):	***Persea macrantha* (Nees) Kosterm.** **= *Machilus macrantha* Nees**
Family:	Lauraceae
Taxonomic status:	Species
Habit:	Large Tree
Habitat:	Semi-evergreen to evergreen
Original Global Distribution:	Peninsular India & Sri Lanka
Current Regional Distribution:	Peninsular India
- Elevation:	upto 2,000 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	> 2,000
- Number of locations:	Many
Population Trends - % change	
- % Decline:	> 20 %
- Time / Rate (Yrs or gens):	3 generations
- No. of Mature Individuals:	Not known
Global Population:	Not known
Regional Population:	Declining
Data Quality	General field studies (M.B. Vishwanathan, 1984- 86 in Javadi Hills)
Recent Field Studies	M.D. Subash Chandran, 1985 onwards in Uttara Kannada; M.B. Vishwanathan, 1992-96 in Kolli hills; S. Armougame, 1996 in Attapady and Manarkkad; K. Ravi Kumar, 1983-95 in Valparai, Bodi, Idduki, Munnar; P.S. Udayan, 1997 in BRT Hills; A.E. Shanawaz Khan, 1996 in Thiruvananthapuram and Pathanamthitta dist., C.G. Kushalappa, 1995 in Kunda, Makut in Coorg; A.G. Pandurangan, 1985-95 in Idukki, Pamba; N. Anil Kumar, 1992-93 in Pathanamthitta; N. Mohanan. 1994-95 in Agastyamalai; K. Ravi Kumar, 1983-97 in Madura! dist.,
Threats (Key):	Harvest for medicine; Harvest for timber; Trade
Trade:	Commercial
Other Comments:	Bark used for medicine prepartion and for agarbathi manufacture. Destructive collection for plywood
Status	
- IUCN:	VULNERABLE (Regionally); DATA DEFICIENT (Globally)
- Criteria based on:	Population reduction (A1a, 1c, 1d)
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Habitat management; Life history studies; Reforestation
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	Not known
- Level of difficulty:	Not known
Existing Cultivations:	Not known
- Names of facilities:	*Ex situ* Conservation, CIMH, MPCP

Sources:

Personal observation/ comments: M.B. Vishwanathan, M.D. Subash Chandran, S. Armougame, K. Ravi Kumar, P.S. Udayan, A.E. Shanawaz Khan, A.G. Pandurangan

Saldanha, C.J, (1984). *Flora of Karnataka* 1:71;

Henry, A.N., G.R. Kumari & V. Chitra (1987). *Flora of Tamil Nadu, India (Ser. 1* Analysis) 2:212;

Matthew, K.M. (1991). *An Excursion Flora of Central Tamil Nadu, India,* p. 434;

Vajravelu. E. (1.990). *Flora of Palakkad Dist,* p. 407; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 2:859 (Repr. ed.);

Cooke, T. (1958). *Flora of the Presidency of Bombay* 3:29 (Repr. ed.);

Ramachandran. V.S. & V.J. Nair (1988). *Flora of Cannanore*

Gandhi (1976). In Saldanha & Nicols., *Flora of Hasan Dist,*

Mathew & Ravi (1983). In Mathew, *Flora of Tamil Nadu Carnatic*

Mohanan, N. & A.N. Henry (1994). *Flora of*

TAXON DATASHEET

EN

Species (& synonyms):	***Plectranthus nilgherricus* Benth.**
Family:	Lamiaceae
Taxonomic status:	Species
Habit:	Tall herb - undershrub
Habitat:	Undergrowth in evergreen forest
Original Global Distribution:	ENDEMIC to southern Western Ghats.
Current Regional Distribution:	Southern Western Ghats
-Elevation:	1,200 - 2,000 m.
- Range (km^2):	< 5,000
- Area Occupied (km^2):	< 500
- Number of locations:	5; Fragmented
Population Trends - % change	
- % Decline:	> 20 %
- Time / Rate (Yrs or gens):	10 years
- No. of Mature Individuals:	Not known
Global Population:	Declining
Data Quality	General field studies
Recent Field Studies	P.S. Udayan, 1992 in Parson's Valley
Threats (Key):	Loss of habitat, Loss of habitat because of fragmentation
Trade:	Not known
Other Comments:	
Status	
- IUCN:	ENDANGERED
- Criteria based on:	Extent of occurence (B1, 2c)
- CITES:	No
- -IWPA(1972;91):	No
Recommendations	
- Research management:	Survey ; Life history studies; Limiting factor
management	
-P.H.VA:	No
Cultivation Program Recommendations	
- Cultivation:	No
-Level of difficulty:	Not
known	
Existing Cultivations:	Not known
- Names of facilities:	--
Sources:	Personal observation/ comments: P.S. Udayan Henry, A.N., G.R. Kumari & V. Chitra (1987). *Flora of Tamil Nadu, India* (Ser.1:Analysis) 2:182; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 2:784 (Repr. ed.) Henry *et al*., *Flora of Tamil Nadu,* Vol. 1-3, BSI Gamble, J.S. (1928). *Flora of Madras Presidency*
Compilers:	Dr. M.P. Nayar, Dr. M.D. Subash Chandran, Dr. S.N. Yoganarasimhan, Mr. A. Kareem, Dr. M.B. Vishwanathan, Mr. Vinay Tandon, Mr. S. Armougame, Dr. S.S.R. Bennet

TAXON DATA SHEET

LRNT-R

Species (& synonyms):	***Pterospermum xylocarpum* (Gaertner) Santapu & Wagh** **= *P: heyneanum* Wallich ex Wight & Arn.**
Family:	Sterculiaceae
Taxonomic status:	Species
Habit:	Tree
Habitat:	Mixed deciduous, Moist deciduous, Semievergreen
Original Global Distribution:	Peninsular India & West Bengal
Current Regional Distribution:	Peninsular India
- Elevation:	upto 900 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	> 2,000
- Number of locations:	Not known
Population Trends - % change	
-% Decline:	>10%
- Time / Rate (Yrs or gens):	2 generations
- No. of Mature Individuals:	Not known
Global Population:	Not known
Regional Population:	Very gradual decline
Data Quality	General field studies
Recent Field Studies	S. Armougame, 1995 in Dohni, Olavakot range in Palaghat; M.B. Vishwanathan, 1995 survey in Alagarkoil MPCA; K. Ravi Kumar survey, 1983-96 in Mudumalai, Trinulvelli, Coimbatore dist.; A.E. Shanawaz Khan, 1990 in Amburi in Thiruvananthapuram; V. Chelladurai and S.P. Subramani in Courtallam MPCA.
Threats (Key):	Loss of habitat; Harvest; Trade for parts
Trade:	Local; Domestic
Other Comments:	Leaves smoked as tobacco; Leaves also used in making plates
Status	
- IUCN:	LOWER RISK - NEAR THREATENED (Regionally) DATA DEFICIENT (Globally)
- Criteria based on:	
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Habitat management; Life history studies
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	No
- Level of difficulty:	Not known
Existing Cultivations:	Not known
- Names of facilities:	
Sources:	Personal observation/comments: S. Armougame, M.B. Vishwanathan, K. Ravi Kumar, A.E. Shanawaz Khan, V Chelladurai, S.P. Subramani Malik, K. E. (1993). *In Sharma, B.D. and M. Sanjappa (Eds.) Flora of India.* 3:454; Saldanha, C.J. (1984). *Flora* of *Karnataka* 1:235; Nair, N,E. & A.N. Henry (1983). *Flora of Tamil Nadu, India* (Ser.1: Analysis) 1:41; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 1:77 (Repr. ed.); Cooke, T. (1958). *Flora of the Presidency of Bombay* 1:138 (Repr. ed);
Compilers:	Dr. M.P. Nayar, Dr. M.D. Subash Chandran, Dr. S.N. Yoganarasimhan, Mr. A. Kareem, Dr. M.B. Vishwanathan, Mr. Vinay Tandon, Mr. S. Armougame, Dr. S.S.R. Bennet

TAXON DATA SHEET

VU-R

Species (& synonyms):	***Raphidophora pertusa* (Roxb.)Schott** = ***Pathos pertusa* Roxb.** **= *Monsters pertusa* (Roxb.)** **= *Seindapsus pertusa* (Roxb.) Schott**
Family:	Araceae
Taxonomic status:	Species
Habit;	Stout epiphytic climbers
Habitat:	Semi Evergreen to Evergreen (Moist Deciduous - Ravi Kumar)
Original Global Distribution:	Southern India and Sri Lanka
Current Regional Distribution:	Southern India
-Elevation:	Upto 1,300 m
- Range (km^2):	< 20,000
- Area Occupied (km^2):	>2,000
- Number of locations:	Many
Population Trends - % change	
- % Decline:	25%
- Time / Rate (Yrs or gens):	10 Years
- No. of Mature Individuals:	Many
Global Population:	Not Known
Regional Population:	Declining
Data Quality	General Field Studies
Recent Field Studies	K. Ravi Kumar, 1983-97 in Idukki, Kodaikonal, Kallar, Tirunelveli, Thenmalai MPCA; M. Sivadasan, 1975-96 in Idukki dist.; A.E. Shanawaz Khan in entire Thiruvananthapuram, Pathanamthitta and Idukki dist., 1994; P.S. Udayan in Charmadi and Subramanya, MPCA 1996; M.D. Subash Chandran. 1996 in Uttara Kannada
Threats (Key):	Loss of Habitat; Trade of parts (inflorescence)
Trade:	Commerical
Other Comments:	Inflorescence in Trade. Aurvedic medicinal ingredients. According to M. Sivadasan, the species *pertusa* is distinct and not a synonym of *lacinata* as described by Saldanha
Status	
- IUCN:	VULNERABLE (Regionally); DATA DEFICIENT (Globally)
- Criteria based on:	Population Reduction (A1c, 1c, 1d)
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Habitat management
-P.H.V.A:	Pending
Cultivation Program Recommendations	
- Cultivation:	Not required
- Level of difficulty:	Least difficult
Existing Cultivations:	Introduced in garden for ornamental
- Names of facilities:	Calicut University Botanical Garden
Sources:	Personal observation/ comments: K. Ravi Kumar, M. Sivadasan, A.E. Shanawaz Khan, P.S. Udayan, M.D. Subash Chandran Fischer, C.E.E. (1957). *In Gamble, J.S. Flora of the Presidency of Madras* 3:1109 (Repr. ed.).Published literature. Saldanha, C.J. (1996). *Flora of Karnataka,* 2:92 Cooke, *Flora of Bombay Presidency* Ramachandran, VS. & V.J. Nair(1988). *Flora of Cannanore* Sivadasan & Nicols (1983). In Mathew, *Flora of Tamil Nadu Camatic*
Compilers:	Dr. V. Chelladurai, Dr. Keshava Murthy, Mr. S.S. Goraya, Ms. Meera Iyer, Dr. N. Loganathan, Dr. VS. Ramachandran, Dr. M. Sivadasan

TAXON DATASHEET

EN-R

Species (& synonyms):	***Salacia oblonga* Wallich ex Wight** & **Am.**
Family:	Hippocrateacae
Taxonomic status:	Species
Habit:	Climbing shrubs
Habitat:	Moist decidous to evergreen
Original Global Distribution:	Western Ghats & Sri Lanka
Current Regional Distribution:	Western Ghats
- Elevation:	upto 1,000 m.
- Range (km^2):	<20,000
- Area Occupied (km^2):	< 500
- Number of locations:	< 5 locations in each state; Fragmented
Population Trends - % change	
- % Decline:	20 %
- Time / Rate (Yrs or gens):	10 years
- No. of Mature Individuals:	Very few
Global Population:	Not known
Regional Population:	Declining
Data Quality	General field studies; Informal field sightings (Keshava Murthy,1984 collection in Sollekkali. Coorg)
Recent Field Studies	V. Chelladurai, 1996; A.E. Shanawaz Khan, 1994 in Pathanamthitta and Thiruvananthapuram dist.,; Mangalore University Botany dept., 1995 in Charmadi and Subramanya MPCAs
Threats (Key):	Loss of habitat; Harvest for medicine
Trade:	Not known
Other Comments:	Compared to low levels of population, exploitation is more; regeneration is poor. Fruits attacked by borers.
Status	
- IUCN:	ENDANGERED (Regionally); DATA DEFICIENT (Globally)
- Criteria based on:	Extent of occurence (B1, 2c)
-CITES:	No
IWPA(1972;91):	No
Recommendations	
- Research management:	Survey; Monitoring; Habitat management; Life history studies
-P.H.V.A.:	Pending results
Cultivation Program Recommendations	
- Cultivation:	Level 3
- Level of difficulty:	Very difficult
Existing Cultivations:	None
- Names of facilities:	
Sources:	Personal Observation/ comments: Keshava Murthy, V. Chelladurai, A.E. Shanawaz Khan Saldanha, C.J. (1996). *Flora of Kamataka* 2:92; Nair, N.E. & A.N. Henry (1983). *Flora of Tamil Nadu, India* (Ser.1:Analysis) 1:75; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 1:155 (Repr. ed.); Cooke, T. (1958). *Flora of the Presidency of Bombay* 1:252 (Repr. ed.)
Compilers:	Dr. V. Chelladurai, Dr. Keshava Murthy, Mr. S.S. Goraya, Ms. Meera Iyer, Dr. N. Loganathan, Dr. V.S. Ramachandran, Dr. M. Sivadasan

TAXON DATASHEET

EN-R

Species (& synonyms):	***Salacia reticulata* Wight**
Family:	Hippocratacae
Taxonomic status:	Species
Habit:	Scandent Shrubs
Habitat:	Semi-evergeen, Coastal
Original Global Distribution:	Southwestern India and Andaman Islands
Current Regional Distribution:	Southwestern India
- Elevation:	upto 300 mts
- Range (km^2):	< 5,000
- Area Occupied (km^2):	< 2,000
- Number of locations:	Many
Population Trends - % change	
- % Decline:	50 %
- Time / Rate (Yrs or gens):	10 years
- No. of Mature Individuals:	Not known
Global Population:	Not known
Regional Population:	Declining
Data Quality:	General field study
Recent Field Studies:	V. Chelladurai & S.P. Subramani; A.E. Shanawaz Khan, 1996 in Thiruvananthapuram Dist.,
Threats (Key):	Harvest for medicine; Trade of parts for medicine (roots); Loss of habitat
Trade:	Commerical
Other Comments:	Plenty in Andamans (Dr. V. Chelladurai). Destrctive collection of roots
Status	
- IUCN:	ENDANGERED (Regionally); DATA DEFICIENT (Globally)
- Criteria based on:	Population reduction (A1c, 1d)
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Survey; Monitoring; Life history studies
-P.H.V.A:	Pending
Cultivation Program Recommendations	
- Cultivation:	None
-Level of difficulty:	Least difficult
Existing Cultivations:	None
- Names of facilities:	TBGRI
Sources:	Personal observation/ comments: V. Chelladurai, S.P. Subramani, A.E. Shanawaz Khan Saldanha, C.J. (1996). *Flora of Karri ataka* 2:92; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 1:154 (Repr. ed.)
Compilers:	Dr. V. Chelladurai, Dr. Keshava Murthy, Mr: S.S. Goraya, Ms. Meera Iyer, Dr. N. Loganathan, Dr. V.S. Ramachandran, Dr. M. Sivadasan

TAXON DATA SHEET

EN-R

Species (& synonyms):	***Santalum album* L.**
Family:	Santalaceae
Taxonomic status:	Species
Habit:	Tree
Habitat:	Dry deciduous & mixed deciduous
Orginal Global Distribution:	Indo-Malaysia
Current Regional Distribution:	Southern India
-Elevation:	upto 1,200 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	> 2,000
- Number of locations:	Many
Population Trends -%	
- % Decline:	>50 %
- Time / Rate (Yrs or gens):	3 generations
- No. of Mature Individuals:	Not known
Global Population:	Not known
Regional Population:	Declining rapidly
Data Quality	General field study (M.B.Vishwanathan, 1984-86 survey in N. Arcot & Kolli hills)
Recent Field Studies	M.B. Vishwanathan, 1992 -96 survey in Kolli hills; V.S. Ramachandran in Topslip MPCA; P.S. Udayan and Noorie, Jan 1997 in BRT Hills. M. Sivadasan, 1970 - 97 in Mallappuram Dist.; K. Ravi Kumar, 1983 -97 in Bodihills, Kodai hills, & Javadi hills
Threats (Key):	Overexploitation; Harvest for timber; Trade of parts; Harvest for medicine; Loss of habitat due to exotic species; Disease
Trade:	Domesitc; Commercial; International
Other Comments:	Lot of research underway in ICFRE. Sandal spike disease in rampant. Commercially traded in tuber and oil
Status	
- IUCN:	ENDANGERED (Regionally); DATA DEFICIENT (Globally)
- Criteria based on:	Population reduction (A1a, 1c, 1d, 1e)
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Habitat management
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	Reforestation
- Level of difficulty:	Very difficult
Existing Cultivations:	In plantations
- Names of facilities:	--
Sources:	Personal observation/ comments: M.B.Vishwanathan, V.S. Ramachandran, P.S. Udayan, Noorie, M. Sivasadasan, K. Ravi Kumar Saldanha, C.J. (1996). *Flora of Karnataka* 2:74; Henry, A.N., G.R. Kumari&V. Chitra (1987). *Flora of Tamil Nadu, India* (Ser.1: Analysis) 2:219; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 2:883 (Repr. ed.); Cooke, T (1958). *Flora of the Presidency of Bombay* 3:49 (Repr. ed.); Matthew, K.M. (1991). *An Excursion Flora of Central Tamil Nadu, India,* p, 439.
Compilers:	Dr. M.P. Nayar, Dr. M.D. Subash Chandran, Dr. S.N. Yoganarasimhan, Mr. A. Kareem, Dr. M.B. Vishwanathan, Mr. Vinay Tandon, Mr. S. Armougame, Dr. S.S.R. Bennet

TAXON DATA SHEET

LRNT -R

Species (& synonyms):	***Sapindus laurifolia Vahl*** **= *S. trifoliatus* sensu Hiern. non L.**
Family:	Sapindaceae
Taxonomic status:	Species
Habit:	Tree
Habitat:	Decidous to semi-evergreen
Orginal Global Distribution:	India & Sri Lanka
Current Regional Distribution:	Southern India
- Elevation:	upto 800 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	> 2,000
- Number of locations:	Many
Population Trends - % change	
- % Decline:	Not known
- Time / Rate (Yrs or gens):	Not known
- No. of Mature Individuals:	Not known
Globai Population:	Not known
Regional Population:	Not declining
Data Quality	General field studies
Recent Field Studies	C.G. Kushalappa, 1995 in BRT Hills; P.S. Udayan, 1996 in Madurai, Trichy, Denkanikottai; P.S. Udayan, 1997 in BRT Hills. Mangalore University, (Botany Dept., 1995 in Charmadi and Subramanya MPCAs . N. Anil Kumar, 1992-93 in Pathanamthitta; N. Mohanan, 1994-95 in Agastyamalai; K. Ravi Kumar, 1992-96 in Coimbatore Dist., Top Slip, Charmadi MPCA
Threats (Key):	Trade for parts
Trade:	Domestic; Commercial
Other Comments:	Fruits widely traded. Effect of fruit harvest on population structure needs to be studied. Demand is increasing.
Status	
- IUCN:	LOWER RISK-NEAR THREATENED (Regionally); DATA DEFICIENT (Globally)
- Criteria based on:	Not applicable
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Monitoring.
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	Commercial cultivation
- Level of difficulty:	Least difficult
Existing Cultivations:	
- Names of facilities:	Widespread
Sources:	Personal observation/ comments: C.G. Kushalappa. P.S. Udayan, K. Ravi Kumar, N. Anil Kumar Saldanha, C.J. (1996). *Flora of Karnataka* 2:196; Nair, N.E. & A.N. Henry (1983). *Flora of Tamil Nadu, India* (Ser.1: Analysis) 1:85; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 1:178 (Repr. ed.); Cooke, T. (1958). *Flora of the Presidency of Bombay* 1:284 (Repr. ed.).
Compilers:	Dr. V. Chelladurai, Dr. Keshava Murthy, Mr. S.S. Goraya, Ms. Meera Iyer, Di. N. Loganathan, Dr. V. S. Ramachandran, Dr. M. Sivadasan

TAXON DATA SHEET

VU

Species (& synonyms):	***Semecarpus travancorica* Beddome**
Family:	Anacardiaceae
Taxonomic status:	Species
Habit:	Tree
Habitat:	Evergreen forest
Orginal Global Distribution:	ENDEMIC to southern Western Ghats.
Current Regional Distribution:	Southern Western Ghats (Anamalai southwards)
-Elevation:	1,300 m.
- Range (km^2):	< 20,000
- Area Occupied (km^2):	< 2,000
- Number of locations:	Few; Fragmented
Population Trends - % change	
- % Decline:	> 20 %
- Time / Rate (Yrs or gens):	3 generations
- No. of Mature Individuals:	Not known
Global Population:	Declining gradually
Data Quality:	General field studies
Recent Field Studies:	N. Mohanan & A.N. Henry, 1994 in Thiruvananthapuram; N. Mohanan, 1994-95 in Agastyamalai; N. Anil Kumar, 1992-93 in Pathanamthitta; K. Ravi Kumar, 1983-97 in Madurai, Tirunelveli, Thenmalai MPCA, Kodaikonal, Topslip, Walparai; M.D. Subash Chandran, 1996 in Uttara Kannada;
Threats (Key):	Loss of habitat
Trade:	Not known
Other Comments:	
Status	
- IUCN:	VULNERABLE
- Criteria based on:	Population reduction (A1c); Extent of occurence (B1, 2c)
- CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Monitoring
-P.H.V.A.:	Yes
Cultivation Program Recommendations	
- Cultivation:	Pending
- Level of difficulty:	Not known
Existing Cultivations:	None
- Names of facilities:	--
Sources:	Personal observation/ comments: K. Ravi Kumar, M.D. Subash Chandran N. Anil Kumar Mukherjee, S.K. *Revision of Anacardiaceae* (Unpublished); Nair, N.E. & A.N. Henry (1983). *Flora of Tamil Nadu, India* (Ser.1: Analysis) 1:89; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 1:190 (Repr. ed.) Mohanan, N. & A.N. Henry (1994). *Flora of Thiruvananthapuram*
Compilers:	Dr. P. Venu, Mr. P.S. Udayan, Ms. Noorunissa Begum, Mr. A.E. Shanawaz Khan, Mr. D.K. Ved, Dr. S.P. Subramani, Ms. Caroline Priya, Dr. C.G. Kushalappa

TAXON DATASHEET

CR

Species (& synonyms):	***Shorea tumbuggaia Roxb.***
Family:	Dipterocarpoceae
Taxonomic status:	Species
Habit:	Medicinal Tree
Habitat:	Deciduous - dry forests
Orginal Global Distribution:	ENDEMIC to southern Eastern Ghats
Current Regional Distribution:	Southern Eastern Ghats
- Elevation:	upto 600 m.
- Range (km^2):	< 5,000
- Area Occupied (km^2):	< 10
- Number of locations:	Very few; Fragmented
Population Trends - % change	
- % Decline:	> 80 %
- Time / Rate (Yrs or gens):	3 generations
- No. of Mature individuals:	Not known
Global Population:	Declining rapidly'
Data Quality	General field study; Indirect information (M.P. Nayar, 1984)
Recent Field Studies	Not known
Threats (Key):	Loss of habitat; Loss of habitat because of fragmentation: Harvest for medicine
Trade:	Not known
Other Comments:	Used as external stimulant
Status	
-IUCN:	CRITICALLY ENDANGERED
- Criteria based on:	Population reduction (A1c); Extent of occurence (B1, 2c)
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Monitoring; Habitat management; Life history studies; Survey; Immediate ex *situ* measures
-P.H.VA:	No
Cultivation Program Recommendations	
-Cultivation:	Level 1; Level 2
-Level of difficulty:	Not known
Existing Cultivations:	Not known
- Names of facilities:	
Sources:	Personal observation/comments: M.P. Nayar Nayar, M.P. (1984). *Endemic & Rare Plants of Eastern Ghats;* Janardhanan, K.P. (1993). *In Sharma, B.D. and M. Sanjappa (Eds.) Flora of India* 3:241; Nair, N.C. & A.N. Henry. (1983). *Flora of Tamil Nadu. India* (Ser.1: Analysis) 1:31; Ahmedullah, M. & M.P. Nayar (1986). *Endemic Plants of the Indian Region* 1:40; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 1:60 (Repr. ed.)
Compilers:	Dr. M.P, Nayar, Dr. M.D. Subash Chandran, Dr. S.N. Yoganaragimhan, Mr. A. Kareem, Dr. M.B. Vishwanathan, Mr. Vinay Tandon, Mr. S. Armougame, Dr. S.S.R. Bennet

TAXON DATASHEET

LRNT -R

Species (& synonyms):	***Smilax zeylanica* L** **= S. *macrophylla* Wight**
Family:	Liliaceae (Smilacaceae)
Taxonomic status:	Species
Habit:	Climbing Shrub
Habitat:	Scrub, Dry deciduous to evergreen
Orginal Global Distribution:	India, Southeast Asia to Java
Current Regional Distribution:	Southern India
-Elevation:	100 to 1500 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	> 2,000
- Number of locations:	Many
Population Trends - % change	
- % Decline:	< 20 %
- Time / Rate (Yrs or gens):	10 years
- No. of Mature Individuals:	Many
Global Population:	Not known
Regional Population:	Declining
Data Quality	General field studies
Recent Field Studies	V. Chelladurai & S.P. Subramani in Courtallam & Peechiparai; Keshava Murthy; V.S. Ramachandran; A.E. Shanawaz Khan, 1994 in Thiruvananthapuram, Pathanamthitta; P.S. Udyan, 1995 in Conoor, Kodanad; Mangalore University Botany Dept., 1995 in Charmadi and Subramanya MPCAs; TBGRI in Triveni MPCA; N. Anil Kumar, 1992-93 in Pathanamthitta; N. Mohanan, 1994-95 in Agastyamalai
Threats (Key):	Loss of habitat; Harvest for medicine; Trade of parts
Trade:	Domestic: Commercial
Other Comments:	Extensive trade in Tamilnadu. No collection from Kamataka. Used as a substitute for S. *china.* 20% decline in Tamilnadu, Kerala not in Karnataka. Roots and leaves in trade.
Status	
- IUCN:	LOWER RISK - NEAR THREATENED (Regionally); DATA DEFICIENT (Globally)
- Criteria based on:	Not applicable
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Monitoring; Habitat management; Life history studies
-P.H.V.A.:	Pending
Cultivation Program Recommendations	
- Cultivation:	Level 3
- Level of difficulty:	Not knwon
Existing Cultivations:	None
- Names of facilities:	--

Smilax zeylanica continued

Sources:

Personal observation/ comments: V. Chelladurai, S.P. Subramani, N. Anil Kumar Keshava Murthy, VS. Ramachandran, A.E. Shanawaz Khan, P.S. Udayan,
Saldanha, C.J. & D.H. Nicolson (1976). *Flora of Hassan District. Karnataka* p. 804;
Henry, A.N., V. Chitra & N.P. Balakrishnan (1989). *Flora of Tamil Nadu, India* (Ser.1 Analysis) 3:42;
Gamble, J.S. 1957. *Flora of the Presidency of Madras* 3:1060 (Repr. ed.);
Cooke, T. 1958. *Flora of the Presidency of Bombay* 3:271 (Repr. ed.)
Mathew & Britto (1983). In Mathew. *Flora of Taml Nadu Carnatic*
Gomdhi (1976). In Saldhanha & Nicols, *Flora of Hasan Dist,*
Manila! (1988). *Flora of Silent Valley*
Mohanan, N. & A.N. Henry (1994). *Flora of Thirvananthapuram*
Ramachandran, V.S. & V.J. Nair (1988). *Flora of Cannanore*
Vajravelu, E. (1990). *Flora of Palghat*

Compilers:

Dr. V. Chelladurai. Dr. Keshava Murthy, Mr. S.S. Goraya, Ms. Meera Iyer,
Dr. N. Loganathan, Dr. V.S. Ramachandran, Dr. M. Sivadasan

TAXON DATASHEET

EN

Species (& synonyms):	***Strychnos aenea* A.W. Hill.** **= S. *rheedii* Brandis**
Family	Logamaceae
Taxonomic status:	Species
Habit:	A large climbing shrub
Habitat:	Found in evergreen forest
Orginal Global Distribution:	ENDEMIC to southern Western Ghats.
Current Distribution:	Southern Western Ghats
-Elevation:	1,500 - 2,000 m.
- Range (km^2):	< 5,000
- Area Occupied (km^2):	< 500
- Number of locations:	5 to 6; Fragmented
Population Trends - %	
- % Decline:	> 50 %
- Time / Rate (Yrs or gens):	3 generations
- No. of Mature Individuals:	Not known
Global Population:	Declining
Data Quality	General field studies; Indirect information
Recent Field Studies	S. Armougame, 1995 in Kaikatty forest, Nelliampathy Range, Palakkad
Threats (Key):	Loss of habitat; Overexpioitation; Harvest for medicine
Trade:	Not known
Other Comments:	Leaves and bark for medicine (M.P. Nayar). Used similar to *Strychnosnux-vomica.* Note : The name given in Henry *et* a/ (1987) is *Strychnos vanprukii* Craib (=S. aenea Hill)
Status	
- iUCN:	ENDANGERED
- Criteria based on:	Population reduction (A1a, 1c, 1d); Extent of occurence (B1,2c)
- -CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Monitoring; Habitat management; Life history studies; Survey
-P.H.V.A.:	Yes
Cultivation Program Recommendations	
- Cultivation:	Level 1
- Level of difficulty:	Not known
Existing Cultivations:	None
- Names of facilities:	
Sources:	Personal observation/ comments: S. Armougame Henry, A.N., G.R. Kumari & V. Chitra (1987). *Flora of Tamil Nadu, India* 2:92; Vajravelu, E. (1990). *Flora of Palghat Dist,* Botanical Survey of India, Calcutta, India P. 295; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 1:610 (Repr. ed.) Manilal, K.S. and V.V. Sivarajan (1982). *Flora of Calicut,* Bishensingh Mahendrapal Singh, Dehradun, India
Compilers:	Dr. M.P, Nayar, Dr.M.D. Subash Chandran, Dr. S.N. Yoganarasimhan, Mr. A. Kareem, Dr. M.B. Vishwanathan, Mr. Vinay Tandon, Mr. S. Armougame, Dr. S.S.R. Bennet

TAXON DATASHEET

VU

Species (& synonyms):	***Swertia corymbosa* (Griseb.) Wight ex B. Clarke**
Family:	Gentianaceae
Taxonomic status:	Species
Habit:	Herb
Habitat:	Grasslands
Orginal Global Distribution:	ENDEMIC to Western Ghats
Current Distribution:	Western Ghats
- Elevation:	above 800 m.
- Range (km^2):	< 20,000
- Area Occupied (km^2):	< 2,000
- Number of locations:	Many, Fragmented
Population Trends - % change	
- % Decline:	> 20 %
- Time / Rate (Yrs or gens):	10 years
- No. of Mature Individuals:'	Many
Global Population:	Declining
Data Quality	General field studies
Recent Field Studies	Keshava Murthy from Coorg; S.N. Yoganarashimhan in Chikmaganglur; N. Anil Kumar, 1992-93 in Pathanamthitta: A.E. Shanawaz Khan, 1995 in Munnar; P.S. Udayan, 1996 in Pykara, Glenmorgan, Ebanad; A.G. Pandurangan in Idukki.
Threats (Key):	Harvest for medicine; Loss of habitat: Loss of habitat due to fragmentation Grazing by animals; Trade
Trade:	Domestic; Commercial
Other Comments:	Used as substitute for *Swertia chirayata.* Grasslands are being converted into plantation by forest department. Three varities have been identified within the specific level, infraspecific variations are not taken into consideration for this assessment. Whole plant is traded.
Status	
- IUCN:	VULNERABLE
- Criteria based on:	Population reduction (A1a, 1c, 1d); Extent of occurence (B1, 2c)
- CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Monitoring; Life history studies
-P.H.V.A.:	Pending results
Cultivation Program Recommendations	
- Cultivation:	Level 3
- Level of difficulty:	Not known
Existing Cultivations:	None
- Names of facilities:	
Sources:	Personal observation/ comments: Keshava Murthy, S.N. Yoganarashimhan. N. Anil Kumar, A.E. Shanawaz Khan, P.S. Udayan, AG. Pandurangan Henry, A.N., G.R. Kumari and V. Chitra (1987). *Flora of Tamil Nadu, India* 2:96; Sharma, B.D. *et* a/., (1977). Studies on the Flora of Nilgiris, Tamil-Nadu. *Biol. Mem.* (Angiosperm Taxonomy Ser.-1), 2:94; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 2:619 (Repr. ed.) Fycon, P.F. (1932). *The Flora of the South Indian Hill Stations,* Vol. I & II, Periodical Expert Book Agency, Delhi, India Ramamurthy (1976). In Saldanha & Nicols, *Flora of Hasan Dish* Mathew & Britto (1983). In Mathew, *Flora of Tamil Nadu Camatic* Manilal (1988). *Flora of Silent Valley*
Compilers:	Dr. V. Chelladurai, Dr. Keshava Murthy, Mr. S.S. Goraya, Ms. Meera Iyer, Dr. N. Loganathan, Dr. V.S. Ramachandran, Dr. M. Sivadasan

TAXON DATASHEET

EN

Species (& synonyms):	***Swertia lawii* (Wight ex B. Clarke) Burkill**
Family:	Gentianaceae
Taxonomic status:	Species
Habit:	Herb
Habitat:	Grasslands
Orginal Global Distribution:	ENDEMIC to Western Ghats
Current Distribution:	Western Ghats
- Elevation:	above 800 m.
- Range (km^2):	< 5,000
- Area Occupied (km^2):	< 500
- Number of locations:	Few; Fragmented
Population Trends - % change	
-% Decline:	> 20 %
- Time / Rate (Yrs or gens):	10 years
- No. of Mature Individuals:	Few
Global Population:	Declining
Data Quality	Indirect information
Recent Field Studies	None
Threats (Key):	Loss of habitat; Loss of habitat because of exotic plants; Grazing by animals
Trade:	Not known
Other Comments:	
Status	
- IUCN:	ENDANGERED
- Criteria Dased on.	Extent of occurence (B1, 2c)
- -CITES:	No
- -IWPA(1972;91):	No
Recommendations	
- Research management:	Survey; Monitoring; Life history studies
-P.H.V.A.:	Pending
Cultivation Program Recommendations	
- Cultivation:	Level 3
- Level of difficulty:	Not known
Existing Cultivations:	None
- Names of facilities:	
Sources:	Gamble, J.S. (1957). *Flora of the Presidency of Madras* 2:619; Ahmedullah, M. & M.P. Nayar (1986): *Endemic Plants of the Indian Region* 1:118; Ramachandran, V,S. & V.J. Nair(1988). *Flora of Cannanore.* BSI. Calcutta, India, P. 292.
Compilers:	Dr. V. Chelladurai, Dr. Keshava Murthy, Mr. S.S. Goraya, Ms. Meera Iyer, Dr. N. Loganathan, Dr. V.S. Ramachandran, Dr. M. Sivadasan

TAXON DATASHEET

LRNT-R

Species (& synonyms):	***Terminalia arjuna (Roxb.* ex DC.) Wight & Arn.**
Family:	Combretaceae
Taxonomic status:	Species
Habit:	Tree
Habitat:	Moist deciduous to semi-evergreen
Orginal Global Distribution:	Deccan, Sri Lanka & the Sub-Himalayan tracts of the North West provinces.
Current Regional Distribution:	Southern India
-Elevation:	Up to 1,400 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	> 2,000
- Number of locations:	
Population Trends - % change	
- % Decline:	< 20 %
- Time / Rate (Yrs or gens):	3 generations
- No. of Mature Individuals:	Not known
Global Population:	Not known
Regional Population:	Declining
Data Quality	General field studies
Recent Field Studies	A.E. Shanawaz Khan, 1987-96 in Palghat, Kasargod; K. Ravi Kumar, 1994 in Thenmalai; C.G. Kushalappa in BRT; Seetharam, 1995 in Sandeu & Kaipakapalli; V. Chelladurai & S.P. Subramani, 1995 in Peechiparai; P.S. Udayan, Nov. 1996 in Asoka Forest, Madurai and Sep, 1996 in Denkanikottai
Threats (Key):	Trade for parts: Harvest for medicine (bark); Harvest for timber
Trade:	Domestic; Commercial
Other Comments:	Bark is used for medicine, Wood is used as Timber-
Status	
- IUCN:	LOWER RISK - NEAR THREATENED (Regionally); DATA DEFICIENT (Globally)
- Criteria based on:	Not applicable
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Montoring
- -P.H.V.A.:	Yes
Cultivation Program Recommendations	
- Cultivation:	Level 1
- Level of difficulty:	Least difficult
Existing Cultivations:	Nurseries on roadsides
- Names of facilities:	
Sources:	Personal observation/ comments: A.E. Shanawaz Khan, K. Ravi Kumar, C.G. Kushalappa, V. Chelladurai & S.P. Subramani, P.S. Udayan Saldanha, C.J. (1996). *Flora of Karnataka* 2:50; Nair, N.E. & A.N. Henry (1983). *Flora of Tamil Nadu, India* (Ser.1: Analysis) 1:149; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 1:329 (Repr. ed.); Cooke, T. 1958. *Flora of the Presidency of Bombay* 1:509 (Repr. ed.). Mathew & Britto (1983). In Mathew, *Flora of Tamil Nadu Camatic* Manilal (1988). *Flora of Silent Valley*
Compilers:	Dr. P. Venu, Mr. P.S. Udayan, Ms. Noorunissa Begum, Mr. A.E. Shanawaz Khan, Mr. D.K. Ved, Dr. P. Subramani, Ms. Caroline Priya, Dr. C.G. Kushalappa

TAXON DATASHEET

CR

Species (& synonyms):	***Trichosanthes anamalayana* Beddome.**
Family:	Cucurbitaceae
Taxonomic status:	Species
Habit:	Climber
Habitat:	Semi-evergreen to shola forests
Orginal Global Distribution:	ENDEMIC to Southern Western Ghats
Current Regional Distribution:	Southern Western Ghats (Anamalais and Megamalais)
-Elevation:	1,000-1.600 m.
- Range (km^2):	< 100
- Area Occupied (km^2):	< 10
- Number of locations:	2; Fragmented
Population Trends - % change	
- % Decline:	50 %
- Time / Rate (Yrs or gens):	10 years
- No. of Mature Individuals:	Not known
Global Population:	Delcining and restricted distribution
Data Quality	Reliable census or population monitoring; General field studies; K. Ravi Kumar, 1984-1990 in Megamalai
Recent Field Studies	S. Armougame, 1995 in Topslip; V.S. Ramachandran, 1996 in Anamalai
Threats (Key):	Human interference; Harvest for medicine; Trade
Trade:	Domestic; Commercial
Other Comments:	Mattew in FTC Vol. 652 (1983) treats *T.bracteata* (Lam.) J. Voigt var. *tomentos* Heyne as a syn. of the above species the two taxa according to Ravi Kumar are distinct.
Status	
-IUCN:	CRITICALLY ENDANGERED
- Criteria based on:	Extent of occurrence (B1, 2c)
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Survey; Monitoring
-P.H.V.A.:	Yes
Cultivation Program Recommendations	
- Cultivation:	Level 1
-Level of difficulty:	Not known
Existing Cultivations:	None
- Names of facilities:	--
Sources:	Personal observation/ comments: S. Armougame, V. S. Ramachandran K. Ravi Kumar Nair, N.E. &A.N. Henry (1983). *Flora of Tamil Nadu, India* 1:174; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 1:374 (Repr. ed); Chakravarty, H.L. (1982). Cucurbitaceae. *Fascicles of Flora of India* 11:107; Matthew, K.M. (1991). *An Excursion Flora of Central Tamil Nadu, India,* p. 216; Ahmedullah, M. & M.P. Nayar. (1986). *Endemic Plants of the Indian Region* ,1:81
Compilers:	Mr. B.V. Shetty, Mr. Purushotham Singh, Dr. S.R. Ramesh, Dr. K. Ravi Kumar, Dr. A.G. Pandurangan, Dr. Ellis, Dr. K.R. Geetha, Ms. Latha

TAXON DATASHEET

DD-R

Species (& synonyms):	***Trichosanthes cucumerina L.***
Family:	Cucurbitaceae
Taxonomic status:	Species
Habit:	Climber
Habitat:	Coast to Deciduous forests
Orginal Global Distribution:	India, Bangladesh, Sri Lanka, Malaysia, Australia
Current Regional Distribution:	Peninsular India (Maharastra, Tamilnadu, Karnataka, Kerala & Andhra Pradesh)
- Elevation:	Up to 800 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	> 2,000
- Number of locations:	Many; Fragmented
Population Trends - % decline	
- % Decline:	Not known
- Time / Rate (Yrs or gens):	Not known
- No. of Mature individuals:	Not known
Global Population:	Not known
Regional Population:	Not known
Data Quality	General field study; Informal field sightings
Recent Field Studies	V.S. Ramachandran in Topslip, 1995; P.S. Udayan, Noorie; 1996 in Shembagathope, Madurai; A.E. Shanawaz Khan, 1996 on the way to Gudalur; S.P. Subramani, 1994 in Thaniparai; N. Anil Kumar, 1992-93 in Pathanamthitta; M.D. Subash Chandran, 1996 in Gunavanti - Honavar Taluk.
Threats (Key):	Not known
Trade:	Not known
Other Comments:	Widely distributed; Locally not, abundant
Status	
- IUCN:	DATA DEFICIENT (Regionally): DATA DEFICIENT (Globally)
Criteria based on:	Not applicable
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	Monitoring
-P.H.V.A.:	No
Cultivation Program Recommendations.	
-Cultivation:	No
- Level of difficulty:	Not known
Existing Cultivations:	None
- Names of facilities:	-.
Sources:	Personal observation/ comments: V.S. Ramachandran, P.S. Udayan, Noorie, A.E. Shanawaz Khan, S.P. Subramani, M.D. Subash Chandran, N. Anil Kumar Nair, N.E. & A.N. Henry (1983). *Flora of Tamil Nadu, India* 1:174; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 1:373 (Repr. ed.); Saldanha, C.J. (1984). *Flora of Karnataka* 1:304; Cooke, T. (1958). *Flora of the Presidency of Bombay* 1:560 (Repr. ed.) Chakravarty, H.L. (1982). Cucurbitaceae. *Fascicles of Flora of India* 11:112; Matthew, K.M. (1991). *An Excursion Flora of Central Tamil Nadu. India,* p. 216. Mathew & Britto (1983). In Mathew, *Flora of Tamil Nadu Camatic*
Compilers:	Mr. B.V. Shetty, Mr. Purushotham Singh, Dr. S.R. Ramesh, Dr. K. Ravi Kumar, Dr,A.G. Pandurangan, Dr. Ellis, Dr. K.R. Geetha, Ms. Latha

TAXON DATASHEET

DD

Species (& synonyms):	***Uvaria hookeri* King** **= *U. narum* Wallich ex Hook. f. & Thomson var. *macrophylla* Hook. f. Thomson**
Family:	Annonaceae
Taxonomic status:	Species
Habit:	Shrub
Habitat:	Evergreen forests
Orginal Global Distribution:	ENDEMIC to southern Western Ghats
Current Regional Distribution:	Southern Western Ghats
- Elevation:	upto 1,000 m
- Range (km^2):	> 20,000
- Area Occupied (km^2):	Not known
- Number of locations:	Not known
Population Trends - % change	
- % Decline:	Not known
- Time / Rate (Yrs or gens):	Not known
- No. of Mature Individuals:	Not known
Global Population:	Not knwon
Data Quality:	Field studies (Keshava Murthy, 1983 in Sollekolli); M.D. Subash Chandran,1996 in Uttara Kannada Secondary forests.
Recent Field Studies:	None
Threats (Key):	Not known
Trade:	Not known
Other Comments:	Not seriously affected in Uttara Kannada but conversion of habitats to monoculture plantations can affect it adversely
Status	
-iUCN:	DATA DEFICIENT
- Criteria based on:	Not applicable
-CITES:	No
-iWPA(1972:91):	No
Recommendations	
- Research management:	Survey; Monitoring
-P.H.V.A.:	No
Cultivation Program Recommendations	
- Cultivation:	None
- Level of difficulty:	Not known
Existing Cultivations:	None
- Names of facilities:	
Sources:	Personal observation/ comments: Keshava Murthy, M.D. Subash Chandran Dubika Mitra, (1993). *In Sharma, B.D.,* W.P. *Balaknshnan. R.R. Rao and P.K. Hajra (Eds.), Flora of India* 1:291 Manilal (1988). *Flora of Silent Valley*
Compilers:	Dr. M.P. Nayar, Qr. M.D. Subash Chandran, Dr. S.N. Yoganarasimhan, Mr. A. Kareem, Dr. M.B. Vishwanathan, Mr. Vinay Tandon, Mr. S. Armougame Dr. S.S.R.Bennet

TAXON DATASHEET

CR

Species (& synonyms):	***Valeriana leschenaultii* DC.**
Family;	Valerianaceae
Taxonomic status:	Species
Habit:	Large herb
Habitat:	Found along margins of Shola/ evergreen forests
Orginal Global Distribution:	ENDEMIC to southern Western Ghats
Current Regional Distribution:	Southern Western Ghats
-Elevation:	1,000 -2,000 m.
- Range (km^2):	< 20,000
- Area Occupied (km^2):	< 500
- Number of locations:	3: Fragmented
Population Trends - % change	
- % Decline:	80 %
- Time/Rate (Yrs or gens):	10 years
- No. of Mature Individuals:	Not known
Global Population:	Declining rapidly
Data Quality:	General field studies
Recent Field Studies:	P.S. Udayan, 1992 in Mudimud; K. Ravi Kumar,1983-91in Megamalai, Madurai
Threats (Key):	Loss of habitat
Trade:	Not known
Other Comments:	
Status	
- IUCN:	CRITICALLY ENDANGERED
- Criteria based on:	Population reduction (A1a, 1c)
- -CITES.	No
-!WPA(1972:91):	No
Recommendations	
- Research management:	Life history studies, Survey: Habitat management
-P.H.V.A.:	Yes
Cultivation Program Recommendations	
- Cultivation:	Level 1
- Level of difficulty:	Not known
Existing Cultivations:	Not known
- Names of facilities:	
Sources:	Personal observation/comments: P.S. Udayan, K.Ravi Kumar Nayar, M.P. *Flora Hot Spots' Endemic plants;* Henry, A.N., G.R. Kumari & V. Chitra (1987). *Flora of Tamil Nadu, India* (Ser.1: Analysis) 2:27; Ahmedullah, M. & M.P. Nayar (1986). *Endemic Plants of the India Region* 1:1.95; Gamble, J.S. (1957). *Flora of the Presidency of Madras* :463 (Repr. ed.)
Compilers:	Dr. M.P. Nayar, Dr. M.D. Subash Chandran, Dr. S.N. Yoganarasimhan, Mr. A. Kareem, Dr. M.B. Vishwanathan, Mr. Vinay Tandon, Mr. S. Armougame, Dr. S.S.R. Bennet

TAXON DATASHEET

LRNT-R

Species (& synonyms):	***Vitex trifolia* L.**
Family:	Verbenaceae
Taxonomic status:	Species
Habit:	Shrub/ Small tree
Habitat:	Coastal India
Orginal Global Distribution:	Coastal India, Sri Lanka, Japan, Philippines, Australia
Current Distribution:	Southern coastal India
- Elevation:	upto 50 m.
- Range (km^2):	> 20,000
- Area Occupied (km^2):	> 2,000
- Number of locations:	Many
Population Trends - % change	
- % Decline:	Not known
- Time / Rate (Yrs or gens):	Not known
- No. of Mature Individuals:	Many
Global Population:	Not known
Regional Population:	Not declining
Data Quality:	General Field Study
Recent Field Studies:	Keshava Murthy, 1994 in Uttara Kannada; V.S. Ramachandran, 1996 in Topslip, Tamil Nadu; A.E. Shanawaz Khan, 1996 in Cannanore
Threats (Key):	Harvest for medicine; Trade for parts
Trade:	Commercial
Other Comments:	
Status	
- IUCN:	LOWER RISK- NEAR THREATENED (Regionally); DATA DEFICIENT (Globally)
- Criteria based on:	Not applicable
-CITES:	No
-IWPA(1972;91):	No
Recommendations	
- Research management:	No
-P.H.VA:	No.
Cultivation Program Recommendations	
-Cultivation:	No
- Level of difficulty:	Not known
Existing Cultivations:	None
- Names of facilities:	
Sources:	Personal observation/ comments: Keshava Murthy, V.S. Ramachandran, A.E. Shanawaz Khan Henry, A.N., G.R, Kumari & V. Chitra (1987). *Flora of Tamil Nadu, India* (Ser.1:Analysis) 2:170; Gamble, J.S. (1957). *Flora of the Presidency of Madras* 2:771 (Repr. ed.); Cooke, T. (1958). *Flora of the Presidency of Bombay* 2:508 (Repr. ed.) Ramachandran, V.S. & V.J. Nair (1988). *Flora of Cannanore*
Compilers:	Dr. V. Chelladurai, Dr. Keshava Murthy**,** Mr. S.S. Goraya, Ms. Meera Iyer, Dr. N. Loganathan**,** Dr. V.S. Ramachandran, Dr. M. Sivadasan

IUCN RED LIST CATEGORIES

I. INTRODUCTION

1. The threatened species categories now used in Red Data Books and Red Lists have been in place, with some modification, for almost 30 years Since their introduction these categories have become widely recognised internationally, and they are now used in a whole range of publications and listings, produced by IUCN as well as by numerous governmental and nongovernmental organisations. The Red Data Book categories provide an easily and widely understood method for highlighting those species under higher extinction risk, so as to focus attention on conservation measures designed to protect them.

2. The need to revise the categories has been recognised for some time. In 1984, the SSC held a symposium, The Road to Extinction (Fitters Fitter, 1987),which examined the issues in some detail, and at which a number of options were considered for the revised system However, no single proposal resulted. The current phase of development began in 1989 with a request from the SSC Steering Committee to develop a new approach that would provide the conservation community with useful information for action planning.

In this document, proposals for new definitions for Red List categories are presented. The general aim of the new system is to provide an explicit, objective framework for the classification of species according to their extinction risk.

The revision has several specific aims

- to provide a system that can be applied consistently by different people;
- to improve the objectivity by providing those using the criteria with clear guidance on how to evaluate different factors which affect risk of extinction;
- to provide a system which will facilitate comparisons across widely different taxa;
- to give people using threatened species lists a better understanding of how individual species were classified.

3. The proposals presented in this document result from a continuing process of drafting, consultation and validation. It was clear that the production of a large number of draft proposals led to some confusion, especially as each draft has been used for classifying some set of species for conservation purposes. To clarify matters, and to open the way for modifications as and when they became necessary, a system for version numbering was applied as follows:

Version 1.0: Mace & Lande(1991)
The first paper discussion a new basis for the categories, and presenting numerical criteria especially relevant for large vertebrates.

Version 2.0: Mace et al. (1992)
A major revision of Version 1.0, including numerical criteria appropriate to all organisms and introducing the non-threatened categories.

Version 2.1: IUCN (1993)
Following an extensive consultation process within SSC, a number of changes were made to the details of the criteria, and fuller explanation of basic principles was included. A more explicit structure clarified the significance of the non-threatened categories.

Version 2.2: Mace & Stuart (1994)
Following further comments received and additional validation exercises, some minor changes to the criteria were made. In addition, the Susceptible category present in Versions 2.0 and 2.1 was subsumed into the Vulnerable category. A precautionary application of the system was emphasised

Final Version
This final document, which incorporates changes as a result of comments from IUCN members, was adopted by the IUCN Council in December 1994.

All future taxon lists including categorisations should be based on this version, and not the previous ones.

4. In the rest of this document the proposed system is outlined in several sections. The Preamble presents some basic information about the context and structure of the proposal, and the procedures that are to be followed in applying the definitions to species. This is followed by a section giving definitions of terms used. Finally the definitions are presented, followed by the quantitative criteria used for classification within the threatened categories. It is important for the effective functioning of the new system that all sections are read and understood, and the guidelines followed.

REFERENCES

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Mace, G. M., *et al.* (1992) "The development of new criteria for listing species on the IUCN Red List" Species 19: 16-22.

Mace. G. M., and Lande. R. (1991) "Assessing extinction threats:toward a re-evaluation of IUCN threatened species categories." Conservation Biology 5-2: 148-157.

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II. PREAMBLE

The following points present important information on the use and interpretation of the categories (= Critically Endangered, Endangered, etc.), criteria (= A to E), and sub-criteria (= a, b etc, i, li etc.):

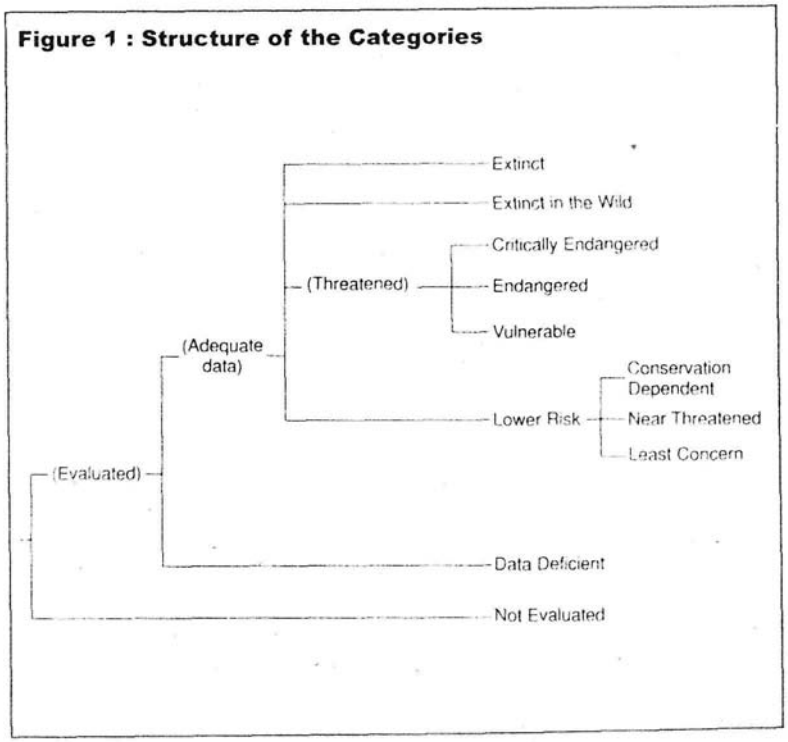
1. Taxonomic level and scope of the categorisation process

The criteria can be applied to any taxonomic unit at or below the species level. The term 'taxon' in the following notes, definitions and criteria is used for convenience, and may represent species of lower taxonomic levels, including forms that are not yet formally described There is a sufficient range among the different criteria to enable the appropriate listing of taxa from the complete taxonomic spectrum, with the exception of micro-organisms. The criteria may also be applied within any specified geographical or political area although in such cases special notice should be taken of point 11 below In presenting the results of applying the criteria, the taxonomic unit and area under consideration should be made explicit. The categorisation process should only be applied to wild populations inside their natural range, and to populations resulting from benign introductions (defined in the draft IUCN Guidelines for Re-introductions as ".an attempt to establish a species, for the purpose of conservation, outside its recorded distribution, but within an appropriate habitat and eco-geographical area").

2. Nature of the categories

All taxa listed as Critically qualify for Vulnerable and Endangered, and all listed as Endangered qualify for Vulnerable. Together these categories are described as 'threatened'. The threatened species categories form a part of the overall scheme. It will be possible to place all taxa into one of the categories (see Figure 1).

Figure 1 : Structure of the Categories



3. Role of the different criteria

For listing as Critically Endangered, Endangered or Vulnerable there is a range of quantitative criteria; meeting any one of these criteria qualifies a taxon for listing at that level of threat. Each species should be evaluated against all the criteria. The different criteria (A-E) are derived from a wide review aimed at detecting risk factors across the broad range of organisms and the diverse life histories they exhibit. Even though some criteria will be inappropriate for certain taxa (some taxa will never qualify under these however close to extinction they come), there should be criteria appropriate for assessing threat levels for any taxon (other than micro-organisms) The relevant factor is whether any one criterion is met, not whether all are appropriate or all are met. Because it will never be clear which criteria are appropriate for a particular species in advance, each species should be evaluated against all the criteria, and any criterion met should be listed.

4. Derivation of quantitative criteria

The quantitative values presented in the various criteria associated with threatened categories were developed through wide consultation and they are set at what are generally judged to be appropriate levels, even if no formal justification for these values exists. The levels for different criteria within categories were set independently but against a common standard. Some broad consistency between them was sought. However, a given taxon should not be expected to meet all criteria (A-E) in a category; meeting any one criterion is sufficient for listing.

5. Implications of listing

Listing in the categories of Not Evaluated and Data Deficient indicates that no assessment of extinction risk has been made, though for different reasons Until such time an assessment is made, species listed in these categories should not be treated as if they were non-threatened and it may be appropriate (especially for Data Deficient forms) to give them the same degree of protection as threatened taxa. at least until their status can be evaluated.

Extinction is assumed here to be a chance process. Thus, a listing in a higher extinction risk category implies a higher expectation of extinction, and over the time-frames specified more taxa listed in a higher category are expected to go extinct than in a lower one (without effective conservation action). However, the persistence of some taxa in high risk categories does not necessarily mean their initial assessment was inaccurate

6. Data quality and the importance of inference and projection

The criteria are clearly quantitative in nature. However, the absence of high quality data should not deter attempts at applying the criteria, as methods involving estimation, inference and projection are emphasised to be acceptable throughout. Inference and projection may be based on extrapolation of current or potential threats into the future (including their rate of change), or of factors related to population abundance or distribution (including dependence on other taxa), so long as these can reasonably be supported. Suspected or inferred patterns in either the recent past, present or near future can be based on any of a series of related factors, and these factors should be specified.

Taxa at risk from threats posed by future events of low probability but with severe consequences (catastrophes) should be identified by the criteria (e.g. small distribution, few locations) Some threats need to be identified particularly early, and appropriate actions taken, because their effects are irreversible, or nearly so (pathogens, invasive organisms, hybridization).

7. Uncertainty

The criteria should be applied on the basis of the available evidence on taxon numbers, trend and distribution, making due allowance for statistical and other uncertainties. Given that data are rarely available for the whole range or population of a taxon, it may often be appropriate to use the information that is available to make intelligent inference about the overall status of the taxon in question. In cases where a wide variation in estimation is found, it is legitimate to apply the precautionary principle and use the estimate (providing it is credible) that leads to listing in the category of highest risk. Where data are insufficient to assign a category (including Lower Risk), the category of 'Data Deficient' may be assigned However, it is important to recognise that this category indicates

that data are inadequate to determine the degree of threat faced by a taxon, not necessarily that the taxon is poorly known. In cases where there are evident threats to a taxon through, for example, deterioration of its only known habitat, it is important to attempt threatened listing, even though there may be little direct information on the biological status of the taxon itself The category 'Data Deficient' is not a threatened category, although it indicates a need to obtain more information on a taxon to determine the appropriate listing.

8. Conservation actions in the listing process

The criteria for the threatened categories are to be applied to a taxon whatever the level of conservation action affecting it. In cases where it is only conservation action that prevents the taxon from meeting the threatened criteria, the designation of 'Conservation Dependent' is appropriate. It is important to emphasize here that a taxon requires conservation action even if it is not listed as threatened

9. Documentation

All taxon lists including categorisation resulting from these criteria should state the criteria and sub-criteria that were met. No listing can be accepted as valid unless at least one criterion is given. If more than one criterion or sub-criterion was met. then each should be listed. However, failure to mention a criterion should not necessarily imply that it was not met. Therefore, if a re-evaluation indicated that the documented criterion is no longer met, this should not result in automatic down-listing. Instead, the taxon should be re-evaluated with respect to all criteria to indicate its status. The factors responsible for triggering the criteria, especially where inference and projection are used, should at least be logged by the evaluator, even if they cannot be included in published lists

10. Threats and priorities

The category of threat is not necessarily sufficient to determine priorities for conservation action. The category of threat simply provides an assessment of the likelihood of extinction under current circumstances, whereas a system for assessing priorities for action will include numerous other factors concerning conservation action such as costs, logistics, chances of success, and even perhaps the taxonomic distinctiveness of the subject

11. **Use at regional level**

The criteria are most appropriately applied to whole taxa at a global scale, rather than to those units defined by regional or national boundaries. Regionally or nationally based threat categories, which are aimed at including taxa that are threatened at regional or national levels (but not necessarily throughout their global ranges), are best used with two key pieces of information: the global status category for the taxon, and the proportion of the global population or range that occurs within the region or nation. However, if applied at regional or national level it must be recognised that a global category of threat may not be the same as a regional or national category for a particular taxon. For example, taxa classified as Vulnerable on the basis of their global declines in numbers or range might be Lower Risk within a particular region where their populations are stable. Conversely, taxa classified as Lower Risk globally might be Critically Endangered within a particular region where numbers are very small or declining, perhaps only because they are at the margins of their global range. IUCN is still in the process of developing guidelines for the use of national red list categories.

12. Re-evaluation

Evaluation of taxa against the criteria should be carried out at appropriate intervals. This is especially important for taxa listed under Near Threatened, or Conservation Dependent, and for threatened species whose status is known or suspected to be deteriorating.

13. Transfer between categories

These are as follows: (A) A taxon may be moved from a category of higher threat to a category of lower threat if none of the criteria of the higher category has been met for 5 years or more. (B) If the original classification is found to have been erroneous, the taxon may be transferred to the appropriate category or removed from the threatened categories altogether, without delay (but see Section 9). (C) Transfer from categories of lower to higher risk should be made without delay.

14. Problems of scale

Classification based on the sizes of geographic ranges or the patterns of habitat occupancy is complicated by problems of spatial scale. The finer the scale at which the distributions or habitats of taxa are mapped, the smaller will be the area that they are found to occupy. Mapping at finer scales reveals more areas in which the taxon is unrecorded. It is impossible to provide any strict but general rules for mapping taxa or habitats; the most appropriate scale will depend on the taxa in question, and the origin and comprehensiveness of the distributional data. However, the thresholds for some criteria (e.g. Critically Endangered) necessitate mapping at a fine scale.

III. DEFINITIONS

1. Population

Population is defined as the total number of individuals of the taxon. For functional reasons, primarily owing to differences between life-forms, population numbers are expressed as numbers of mature individuals only. In the case of taxa obligately dependent on other taxa for all or part of their life cycles, biologically appropriate values for the host taxon should be used

2. Subpopulations

Subpopulations are defined as geographically or otherwise distinct groups in the population between which there is little exchange (typically one successful migrant individual or gamete per year or less).

3. Mature individuals

The number of mature individuals is defined as the number of individuals known, estimated or inferred to be capable of reproduction When estimating this quantity the following points should be borne in mind:

- Where the population is characterised by natural fluctuations the minimum number should be used.
- This measure is intended to count individuals capable of reproduction and should there tore exclude individuals that are environmentally, behaviourally or otherwise repro ductively suppressed in the wild.
- In the case of populations with biased adult or breeding sex ratios it is appropriate to use lower estimates for the number of mature individuals which take this into account (e.g. the estimated effective population size).
- Reproducing units within a clone should be counted as individuals, except where such units are unable to survive alone (e.g. corals).
- In the case of taxa that naturally lose all or a subset of mature individuals at some point in their life cycle, the estimate should be made at the appropriate time, when mature individuals are available for breeding.

4. Generation

Generation may be measured as the average age of parents in the population This is greater than the age at first breeding, except in taxa where individuals breed only once

5. Continuing decline

A continuing decline is a recent, current or projected future decline whose causes are not known or not adequately controlled and so is liable to continue unless remedial measures are taken. Natural fluctuations will not normally count as a continuing decline, but an observed decline should not be considered to be part of a natural fluctuation unless there is evidence for this

6. Reduction

A reduction (criterion A) is a decline in the number of mature individuals of at least the amount (%) stated over the time period (years) specified, although the decline need not still be continuing. A reduction should not be interpreted as part of a natural fluctuation unless there is good evidence for this. Downward trends that are part of natural fluctuations will not normally count as a reduction.

7. Extreme fluctuations

Extreme fluctuations occur in a number of taxa where population size or distribution area varies widely, rapidly and frequently, typically with a variation greater than one order of magnitude (i.e., a tenfold increase or decrease).

8. Severely fragmented

Severely fragmented refers to the situation where increased extinction risks to the taxon result from the fact that most individuals within a taxon are found in small and relatively isolated subpopulations. These small subpopulations may go extinct, with a reduced probability of recolonisation.

9. Extent of occurrence

Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon, excluding cases of vagrancy This measure may exclude discontinuities or disjunctions within the overall distributions of taxa (e.g., large areas of obviously unsuitable habitat) (but see 'area of occupancy'). Extent of occurrence can often be measured by a minimum convex polygon (the smallest polygon in which no internal angle exceeds 180 degrees and which contains all the sites of occurrence).

10. Area of occupancy

Area of occupancy is defined as the area within its 'extent or occurrence' (see definition) which is occupied by a taxon, excluding cases of vagrancy. The measure reflects the fact that a taxon will not usually occur throughout the area of its extent of occurrence, which may, for example, contain unsuitable habitats.

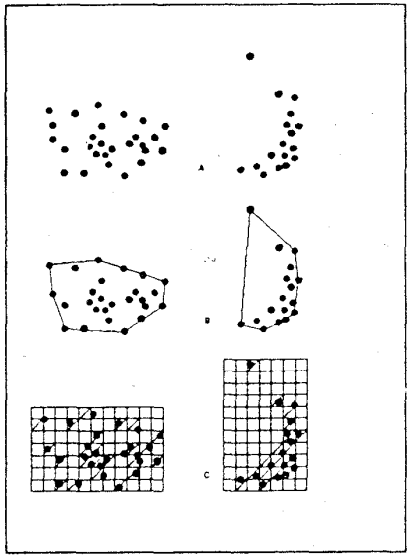


Fig. 1. Two examples of the distinction between the extent of occurrence and area of occupancy. (a) and (b) are the spatial distribution of known, inferred, or projected sites of occurrence. (c) and (d) show one possible boundary to the extent of occurrence, which is the measured area within this boundary. (e) and (f) show one measure of area of occupancy which can be measures by the sum of the occupied grid squares.

The area of occupancy is the smallest area essential at any stage to the survival of existing populations of a taxon (e.g. colonial nesting sites, feeding sites for migratory). The size of the area of occupancy will be a function of the scale at which it is measured, and should be at a scale appropriate to relevant biological aspects of the taxon. The criteria include values in sq km., and thus to avoid errors in classification, the area of occupancy should be measured on grid squares (or equivalents) which are sufficiently small (see Figure 2).

11. Location

Location defines a geographically or ecologically distinct area in which a single event (eg pollution) will soon affect all individuals of the taxon present. A location usually, but not always, contains all or part of a subpopulation of the taxon. and is typically a small proportion of the [axon's total distribution.

12. Quantitative analysis

A quantitative analysis is defined here as the technique of population viability analysis (PVA), or any other quantitative form of analysis, which estimates the extinction probability of a taxon or population based on the known life history and specified management or non-management options. In presenting the results of quantitative analyses the structural equations and the data should be explicit.

IV THE CATEGORIES

EXTINCT (EX)
A taxon is Extinct when there is no reasonable doubt that the last individual has died.

EXTINCT IN THE WILD (EW)
A taxon is Extinct in the wild when it is known only to survive in cultivation, in captivity or as a naturalised population (or populations) well outside the past range. A taxon is presumed extinct in the wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

CRITICALLY ENDANGERED (CR)
A taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future, as defined by any of the criteria (A to E) on subsequent pages.

ENDANGERED (EN)
A taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future, as defined by any of the criteria (A to E) on subsequent pages.

VULNERABLE (VU)
A taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future, as defined by any of the criteria (A to D) on subsequent pages.

LOWER RISK (LR)
A taxon is Lower Risk when it has been evaluated, does not satisfy the criteria for any of the categories Critically Endangered, Endangered or Vulnerable. Taxa moulded in the Lower Risk category can be separated into three subcategories

1. **Conservation Dependent (cd).** Taxa which are the focus of a continuing taxon-specific or habitat-specific conservation programme targeted towards the taxon in question, the cessation of which would result in the taxon qualifying for one of the threatened categories above within a period of five years.

2. **Near Threatened (nt).** Taxa which do not quality for Conservation Dependent, but which are close to qualifying for Vulnerable

3. **Least Concern (Ic).** Taxa which do not qualify for Conservation Dependent or Near Threatened.

DATA DEFICIENT (DD)
A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/ or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution is lacking. Data Deficient is therefore not a category of threat or Lower Risk. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available In many cases great care should be exercised in choosing between DD and threatened status It the range of a taxon is suspected to be relatively circumscribed, if a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified

NOT EVALUATED (NE)
A taxon is Not Evaluated when it has not yet been assessed against the criteria.

V. THE CRITERIA FOR CRITICALLY ENDANGERED, ENDANGERED AND VULNERABLE

CRITICALLY ENDANGERED (CR)
A taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future, as defined by any of the following criteria (A to E):

A. Population reduction in the form of either of the following:

1. An observed, estimated, inferred or suspected reduction of at least 80% over the last 10 years or three generations, whichever is the longer, based on (and specifying) any of the following:

(a) direct observation
(b) an index of abundance appropriate for the taxon
(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
(d) actual or potential levels of exploitation
(e) the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.

2. A reduction of at least 80%, projected or suspected to be met within the next ten years or three generations, whichever is the longer, based on (and specifying) any of (b), (c), (d) or (e) above.

B. Extent of occurrence estimated to be less than 100 km^2 or area of occupancy estimate to be less than 10km^2, and estimates indicating any two of the following:

1. Severely fragmented or known to exist at only a single location.

2. Continuing decline, observed, inferred or projected, in any of the following:

(a) extent of occurrence
(b) area of occupany
(c) area, extent and/or quality of habitat
(d) number of locations or subpopulations
(e) number of mature individuals.

3. Extreme fluctuations in any of the following:
(a) extent of occurrence
(b) area of occupancy
(c) number of locations or subpopulations
(d) number of mature individuals.

C. Population estimated to number less than 250 mature individuals and either:

1. An estimated continuing decline of at least 25% within 3 years or one generation, whichever is longer OR

2 A continuing decline, observed, projected, or inferred, in numbers of mature individuals and population structure in the form of either:

(a) severely fragmented (i.e. no subpopulation estimated to contain more than 50 mature individuals)

(b) all individuals are in a single subpopulation.

D. Population estimated to number less than 50 mature individuals.

E. Quantitative analysis showing the probability of extinction in the wild is at least 50% within 10 years or 3 generations, whichever is the longer.

ENDANGERED (EN)

A taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future, as defined by any of the following criteria (A to E)

A. Population reduction in the form of either of the following:

1. An observed, estimated, inferred or suspected reduction of at least 50% over the last 10 years or three generations, whichever is the longer, based on (and specifying) any of the following:

(a) direct observation
(b) an index of abundance appropriate for the taxon
(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
(d) actual or potential levels of exploitation
(e) the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.

2. A reduction of at least 50% projected or suspected to be met within the next years or three generations, whichever is the longer, based on (and specifying) any of (b), (c), (d) or (e) above.

B. Extent of occurrence estimated to be less than 5000 km^2 or area of occupancy estimated to be less than 500 km^2, and estimates indicating any two of the following:

1. Severely fragmented or known to exist at no more than five locations

2. Continuing decline, inferred, observed or projected, in any of the following:

(a) extent of occurence
(b) area of occupancy
(c) area, extent and/or quality of habitat
(d) number of locations or subpopulations
(e) number of mature individuals.

3 Extreme fluctuations in any of the following:
(a) extent of occrrence
(b) area of occupancy
(c) number of locations or subpopulations
(d) number of mature individuals.

C. Population estimated to number less than 2500 mature individuals and either:

1. An estimated continuing decline of at least 20 within 5 years or 2 generations, whichever is longer, OR

2. A confining decline, observed, projected, or inferred, in numbers of mature individuals and population structure in the form of either:

(a) severely fragmented (ie. no. subpopulation estimated to contain more than 250 mature individuals)

(b) all individuals are in a single subpopulation.

D. Population estimated to number less than 250 mature individuals.

E. Quantitative analysis showing the probability of extinction in the wild is at least 20% within 20 years or 5 generations, whichever is the longer.

VULNERABLE (VU)

A taxon is Vulerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future, as defined by any of the following criteria (A to E):

A. Population reduction in the form of either of the following:

1. An observed, estimated, inferred or suspected reduction of at least 20% over the last 10 years or three generations, whichever is the longer, based on (and specifying) any of the following:
(a) direct observation
(b) an index of abundance appropriate for the taxon
(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
(d) actual or potential levels of exploitation
(e) the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.

2. A reduction of at least 20% projected or suspected to be met within the next ten years or three generations, whichever is the longer, based on (and specifying) any of

s above,

B. Extent of occurrence estimated to be less than 20,000 km^2 or area of occupancy estimated to be less than 2000 km^2, and estimates indicating any two of the following:

1. Severely fragmented or known to exist at no more than ten locations.

2. Continuing decline, inferred, observed or projected, in any of the following,
(a) extent of occurrence
(b) area of occupancy
(c) area, extent and/or quality of habitat
(d) number of locations or subpopulations
(e) number of mature individuals

3. Extreme fluctuations in any of the following:
(a) extent of occurrence
(b) area of occupancy
(c) number of locations or subpopulations
(d) number of mature individuals

C. Population estimated to number less than 10,000 mature individuals and either:

1. An estimated continuing decline of at least 10% within 10 years or 3 generations, whichever is longer, OR

2. A continuting decline, observed, projected, or inferred, in numbers of mature individuals and population structure in the form of either

(a) severely fragmented (i.e. no subpopulation estimated to contain more than 1000 mature individuals)

(b) all individuals are in a single subpopulation

D. Population very small or restricted in the form of either of the following:

1. Population estimated to number less than 1000 mature individuals.

2. Population is characterised by an acute restriction in its area of occupancy (typically less than 100km^2) or in the number of locations (typically less than 5). Such a taxon would thus be prcne to the effects of human activities (or stochastic events whose impact is increased by human activities) within a very short period of time in an unforeseeable future, and is thus capable of becoming Critically Endangered or even Extinct in a very short period.

E. Quantitative analysis showing the probability of extinction in the wild is at least 10% within 100 yea