Rare, Endangered and Threatened (RET) Species of Indian Himalayan Region (IHR)

Sr. No.	Botanical Name	Habitat and Ecology	Conservation Measures Taken	Conservation Measures Proposed	Biology and Potential Value	Cultivation	Reference	Source
1	*Acer caesium* Wall. ex Brandis	The species is the largest maple in the Western Himalayas. It grows at 2130-3050 m altitude in its distribution range. It is characteristic of the moist temperate deciduous forest subtype of Lower Western Himalayan temperate forests occurring in association with temperate deciduous tree genera like *Corylus, Aesculus, Prunus, Ulmus, Carpinus* and *Betula* and the *lauraceous* genera like *Litsea, Lindera* and *Machilus.* In Upper wet Himalayan temperate forests the species is in *Quercus-Abies* and *Quercus-Acer* association with dominating Oaks like *Quercus incana, Q. semicarpifolia, Q. dilatata* and *Abies pindrow.*	Decades back it was a common tree in the Western Hima- layas usually found in open grassy places and in moist patches of broad-leaved forests (9). Only recent surveys (4, 5) denote that the existence of the species in the western Himalayas is threatened. No measure to eliminate threat to its existence is presumably yet taken.	(i) To introduce the species in protected reserve forests of Western Himalayan States, (ii) to maintain its germ-plasm by keeping its seeds in seed banks and replacing them by fresh collection every year as seeds of *A. caesium* have poor viability (3).	This is the largest *Acer* in Western Himalaya and is termed as the Indian Maple (10), often attaining a height of 20-25 m and a girth of about 3.6-3.9 m (1), twigs reddish blue, giving a handsome and distinctive look in forest landscape. The wood is strong, can take well seasoning and is suitable for furniture, turnery frames, boarding, bowls and other domestic appliances (1).	Not Known	1. Anon. (1948). *Acer* species. *In: Wealth of India* 1. p. 21-22. C.S.I.R., New Delhi. 2. Anon. (1952). Notes on the utilization and silviculture of the timbers used in wood based industries of India. Ind. For. 78: 274-288, 348-370. 3. Dent, T .A. (1948). Seed storage with particular reference to the storage of seeds of Indian forest plants. Ind. For. Rec. (N.S.) Silviculture 7 (1); Govt. of India, Delhi. 4. Hajra, P.K. (1983a). Plants of North Western Himalayas with restricted distribution- a census. In: Jain, S. K. & Rao, R. R. (ed). An assessment of threatened plants of India. Botanical Survey of India, Howrah. p. 1-12. 5. Hajra, P.K. (1983b). Western Himalayas. In: Jain, S. K. & Sastry, A. R. K. (ed). Materials for a catalogue of threatened plants of India. Botanical Survey of India, Howrah. p.49-61. 6. Karnik, M. G. & Misra, A. K. (1964). Maple wood (Acer caesium) for tooth-pick industry. Ind. For. 90:310-311. 7. Murray, E. (1975). Aceraceae. In: Nasir,E. & Ali, S. I. (ed.) Flora of West Pakistan No. 92. p. 1-7 with 5 pl. 8. Nayar, M. P. & Anukul Datta (1982). Aceraceae. Fasc. Fl. India 9: 1-22, with plates. Botanical Survey of India, Howrah. 9. Parker, R. N. (1918). A forest flora for the Punjab with Hazara and Delhi. p. 102-105. 10. Watt, G. (1889). Dictionary of economic products of India. 1: 67-72 (reprinted ed. 1972) Dehradun.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

2	*Acer hookeri* Miquel var. majus Pax	Occurs in much lower elevation than the species. The forests of the area are typified as East Himalayan subtropical wet Hill forests associated with *Castanopsis .. tribularis, Engelhardtia spicata, Betula cylindrostachys, Schima wallichiana, Alnus nepalensis, ~ Cedrela* and *Eurya* spp. The taxon is also closely associated with *Acer thomsoni* (2).	None	(a) To survey extensively its type locality and adjacent . places and to examine as far as possible the population areas of *A. hookeri,* (b) if redisco-vered, to declare its place/places of occurrence as protected reserve/reserves, (c) to ban collection of the plants, if extant, for botanical interests/scientific studies, (d) to atte~pt for regeneration and introduction to other areas having similar habitat and ecological conditions, (e) to conserve its germ-plasm (seed) in modern seed banks	The variety differs from the species in respect of leaves which are thicker (leathery), larger and with margin imperfectly biserrate and serrature less cuspidate; samara wings straight.	Not known.	1. Anon. (1907). Forests, Gazetteer of the Darjeeling District. *Bel.* Government of Bengal, Calcutta. p. 98. 2. Anon. (1970). *Tenth working plan for the Darjeeling Forest Di}* 1967-68-1976-77. vol. 1 (part 1 & Appendices i-xiv) and vol. 2 (part 2 Directorate 'of Forests, Government of West Bengal. Calcutta. 3. Nayar, M. P. & Anukul Datta (1982). Aceraceae. *Fasc. Fl. In'* Survey of India, Howrah. 4. Pax, F. (1886). Monographie der Gattung *Acer. In:* Engler, A. *Bol* (see p. 216).	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

3	*Acer oblongum* Wall. ex DC. var. *membranaceum* Banerji	In lower Western Himalayan temperate forests dominated by *Quercus incana* (Ban oak forests) from Jharipanito the upper ridges of Mussoorie hills (alt. 1500-1800 m) in association with tree species like *Rhododendron arboreum, Machilus odora-tissima,* M. *duthiei, Phoebe lanceolata, Cornus microphylla, Aesculus indica* along with Acers like A. *laevigatum,* A. *caesium,* A. *cappadocicum* and A. *oblongum* var. *oblongum;* conifers are much less common here, only *Pinus roxburghii* is abundant. Most of the trees above 1500 m are broad-leaved as 8 months of the year are comparatively dry (3, 6, 7).	None. The variety is recognized (l) recently and remained unknown to its early collectors.	(a) To survey Mussoorie and vicinity in; the outermost range of the Himalayas and adjacent Siwalik ranges to examine as far as possible all the A. *oblongum* stands of the area/areas, (b) if rediscovered, to declare its localities as protected re- serve/reserve$, (c) to take up stringent measures for its in *situ* conservation as the "local people use the timber of A. *oblongum* for making various domestic utensils and agricultural equipments which is a potential threat factor, (d) to attempt for its regeneration and introduction in habitats with identical ecological conditions, (e) to preserve its seeds either collected from living plant in the wild, or if non-extant, from all possible private and institutional collections.	Unlike var. *oblongum* and var. *microcarpum* of the species, this variety has very thin papery leaves which are dull red or reddish-brown on both the surfaces. So unlike the trees of var. *oblongum* in which foliage assume red colour in spring time (2) the foliage of the trees of this variety wear dazzling red/reddish brown colour throughout the year giving it a distinctive appearance.	Not known. A. *oblongum* is regarded as an ornamental plant and is cultivated in gardens (5). Efforts should be made for introducing this variety along with var. *oblongum i*n gardens.	1. Banerji, M. L. (1983). *Phytologia* 9(5): 265-266. 2. Dakshini, M.B. (1984). Role of forest trees in landscaping. *Indian Forest Bulletin* 277 (N.S.) *Botany.* Control1er of Publications, Government of India, Delhi. p. 1-15. 3. Gupta, R. K. (1967). *Seasonal flowers of the Indian summer resorts: Mussoorie Hills.* Navayug Traders, New Delhi. 4. Nayar, M.P. & Anuku1 Datta (1982). Aceraceae, *Fasc. Fl. India* 9:1-22. Botanical Survey of India, Howrah. 5. Parker, R.N. (1918). *A forest flora for the Punjab with Hazara and Delhi.* p. 102-105. 6. Raizada, M.B. (1959). Mussoorie and its plants. *Ind. For.* 85: 668-690. 7. Raizada, M.B. & Saxena, H. O. (1978). *Flora of Mussoorie.* 1. Bishen Singh and Mahendra Pal SIngh, Dehra Dun.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
4	*Acer oblongum* Wall. ex DC. var. *microcarpum* Hiern	In subtropical pine forests dominated by *Pinus insularis* along with the association of forest elements mentioned in the report on *Acer sikkimense* var. *serrulatum* (2, 4).	None. Since the collection of Griffith, there is no report of its further collection. The area in the remotest northeastern part of the country requires further extensive exploration in the Arunachal Pradesh region.	(a) To survey extensively Mishmee hill area and vicinity to locate the species, (b) if rediscovered in the wild, to declare the area as a protected reserve by the State Government, (c) to check its further depletion, to ensure that no collection of the taxon is made from the wild, (d) to try for its introduction in other areas having similar habitat *r* and ecological environment, (e) to preserve and maintain its germplasm in seed bank.	The variety is taxonomically distinct from the species in respect of leaf size, which are much smaller than those of the species.	Not known.	1. Anon. (1908). Mishmi Hills. *The Imperial Gazetteer of India,* vol. 17. (New Edition) Clarendon Press, Oxford. 2. Champion H. G. & Seth, S. K. (1968). *A revised survey of the forest types of India.* Manager of publications, Government of India, Delhi. 3. Hiern, W. P. (187~). *Acer* in Sapindaceae. *In:* Hooker, J. D., *Fl. Brit. India.* 3:693. 4. Joseph, J. & Chauhan, A.S. (1983), Namdapha Wild Life Sanctuary, Tirap, Arunachal Pradesh. In: Jain, S.K. and Sastry, A.R.K. (compiled). *Botany of some tiger habitats in India.* Botanical Survey of India, Howrah. 5. Nayar, M. P. & Anukul Datta (1982). Aceraceae. *Fasc, Fl. India* 9: 1-22. Botanical Survey of India, Howrah. 6. Pax, F. (1886). Monographie der Gattung Acer. *In:* Engler, A. *Bot. Jahrb.* 7: 177-263.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

5	*Acer osmastonii* Gamble	The taxon was reported from Darjeeling Himalaya in the alt. 1500- 2400 m in association with *Machilus edulis, Alcinandra cathcartii, Cinnamomum obusifolium, Magnolia campbellii, Schima wallichiana, Castanopsis tribuloides, Litsea, Engelhardtia* and *Machilus* spp. in the lauraceous forests and with *Quercus lamellosa, Q. lineata, Symplocos theaefolia, Betula alnoides, Eriobotrya bengalensis, Itea macrophylla, Meliosma wallichii, Rhus' succedanea* along with *Acer campbellii, A. laevigatum, A. hookeri* and *A. sikkimense* in the Bukoak forest of Darjeeling montane wet temperate forests. In Dhera Dun the hybrid is reported to occur on the hill slopes at lower elevation.	None for the wild habitat.	(a) To survey its type locality and the places of its previous collections for its present status in the wild and to declare them as protected reserves by the State/Central Government and to take steps to increase its population in the wild, (b) to obtain seeds from all possible private and institutional collections and grow them for replanting in the original and known habitat, (c) in the event of failure of seed germination for of long storage which is characteristic of *Acer* (3), propagation and conservation through grafting may be tried.	The taxon is unique as it is the only natural hybrid among the Indian Acers. It is taxonomically distinct from other Indian Acers in having both lobed and unlobed leaves in the same plant (8). Besides, as reported by Gamble (5) and observed by Nayar and Datta (9) this species with its dazzling red colour of the emerging young leaves, should be of ornamental value. Its commercial value as a timber plant is not ruled out as both of its parent species, *A. laevigatum* and *A. campbellii* are regarded as commercial timber-yielding plants and extensively cultivated.		1. Anon. (1907). Forests. Gazetteer of the Darjeeling District, *Bengal District Gazetteers. Govt. of Bengal, Calcutta. p. 98.* 2. Anon. (1959). *Fourth working plan for Kurseong Forest Division:* 1954-55-1963-64. 1 (part 1 & Appendices i-xi). Directorate of Forests, Govt. of West Bengal. 3. Dent, T. A. (1948). Seed storage with particular reference to the storage of seeds of Indian forest plants. *Indian Forest Records* (N.S) *Silviculture* 7 (I). Government of India, Delhi. part 2, p. 68. 4. Gamble, J. S. (1881). *A manual of Indian timbers.* (rep. ed. 1972) Dehra Dun. p. 199 and -202. 5. Gamble J. S. (1908). *Acer osmostonii.* In Decades Kewenses Decas LI. *Bull. Misc Inform.* 1908 : 446. 6. Ghose, B. N. (1958). A catalogue of plants of the Sikkim Himalayas. *Bengal Nat. Hist. Soc.* 29 (4): 161-167. 7. Mehra, P. N., P. K. Khosla & T. S. Sarin (1972). Cytological studies of Himalayan Aceraceae, Hippocastanaceae, Sapindaceae and Staphylace. *Silvae Genet.* 21 :96-102. 8. Mehra, P. N., K. S. Bawa, P. K. Khosla & A. S. Hans (1983). Floristic account of some forest types of the Eastern Himalayas. *Bull. Bot. Surv. India* 25 (1-4) : 1-18. 9. Nayar, M; P. & Anukul Datta (1982). Aceraceae. *Fasc. Fl. India* 9: 1-22. Botanical Survey of India, Howrah.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
6	*Acer sikkimense* Miquel var. *serrulatum* Pax	In subtropical pine forests dominated by *Pinus insularis* in associa- tion of *Quercus griffithii, Q. fenestrata, Magnolia campbellii, Prunus acuminata, Betula alnoides, Schima wallichiana, Castano psis* and *Rhus* spp.	None. Since Griffith's collection in 1838 it has never been collected again. The area having been the most remotest northeastern part of Arunachal Pardesh largely remained under-explored (1), and it has not been possible to exactly locate its place of occurrence and survey its population.	(a) To survey extensively the Mishmee hills area to locate the taxon, (b) if rediscovered in the wild, to declare the area as a protected reserve by the State Government, (c) to ensure that no collection of the taxon is made from the wild, (d) to attempt to introduce it to other areas which have similar natural habitat and ecological environment, and to preserve and maintain its germ-plasm in modem seed banks.	The variety is taxonomically distinct from the species in . respect of serrulation of leaf margin which in the species is entire to subentire.	Not known	1. Anon. (1908) Mishmi Hills. *The Imperial Gazetteer of India.* 17. ,New Edition. Oxford, : Clarendon Press, 1908. p. 377-378. 2. Griffith, W. (1848). *Posthumous papers.* 2. Itinerary Notes. Calcutta. 3. Joseph, J. & Chauhan, A. S. (1983). Namdapha Wild Life Sanctuary, Tirap, Arunachal Pradesh. *In:* Jain, S. K. & Sastry, A.R.K. (Com.) *Botany of some Tiger habitats in India.* Botanical Survey of India. Howrah. 4. Nayar, M. P. & Anukul Datta (1982). Aceraceae. *Fasc. Fl. India* 9: 1-22. Botanical Survey of India, Howrah. 5. Pax, F. (1886). Monographie der Gattung Acer. *In:* Engler, A., *Bot. Jahrb.* 7:177-263.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

7	*Trivalvaria kanjilalii* D. Das	It grows in moist, shady areas	None on record	(a) Steps have to be taken to locate this species for *in situ* conservation; (b) exploration in all previous known localities to obtain seeds for seed banks or for introduction in the botanical gardens.	A little known shrub of unknown economic uses. Flowers pale green or yellow, not very showy, appearing during October-November in wild. It may- be a potential garden plant	Not Known	1. Balakrishnan, N. P. (1981). *Fl. Jowai* I: 65. Botanical Survey of India, Howrah.. 2. Das, D. (1968). Bull. Bot. Surv. India 10: 263.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
8	*Heracleum jacquemontii* Clarke	Not known	None	Efforts to relocate the taxon, study of its taxonomy and biology and to evaluate the prospects of its conservation through *in situ* or/and. *ex situ* methods.	Not studied; botanical interest		1. Clarke, C. B. (1879). Umbelliferae. *In:* Hooker, J. D., *Fl. Brit. India* 2: 712. 2. Hajra, P. K. (1984). *In:* Jain, S. K. & Sastry, A. R. K. (ed. & compil.) *The Indian Plant Red Data Book-I.* Botanical Survey of India, Howrah. p. 21.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
9	*Pimpinella tongloensis* Mukh	Data not available	None	Exploration to relocate populations of the species and to evaluate the prospects of *ex situ* and *in situ* conservation.	Not Screened	Not Known	1. Mukherjee, P. K. (1970). On the identification and typification of *Pimpinella urceolata* Watt ex Banerji (Apiaceae). *Bull. Bot. Sur. Ind.* 12:77-79. t. 2.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
10	*Pimpinella wallichii* Clarke	Data not available	None at present	Efforts to relocate populations of this species and study of biology and ecology; to evaluate possibilities of *ex situ* and/or *in situ* conservation.	None reported; botanical interest	Not Known	1. Banerji, M. L. (1966). Contributions to the flora of east Nepal. *Rec. Bot. Surv. Ind.* (19: 49). 2. Clarke, C. B. (1879). Umbelliferae, In: Hooker, J.D., *Fl. Brit. India 2: 685.*	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
11	*Ptenopetalum radiatum* (W. W. Sm.) Mukh. (*Pimpinella radiata* W. W. Sm.)	Not known but probably it is to be found as an epiphyte on moss laden tree trunks- on *Rhododendrons, Abies* or *Tsuga* which abound in these localities.	None really necessary in the area presently as no threat of any consequence exists.	To explore extensively and intensively for populations still occurring in the area, to study the biology and ecology of the plants and to restrict such areas to visitors.	Not studied.	Not Known	1. Mukherjee, P. K. (1971). A note on the correct identity of *Pimpinella radiata* W. W. Sm. *Ind. For.* 97 (1): 55.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
12	*Wallichia triandra* (Joseph) S. K. Basu	Grows on humus rich soils amidst thick undergrowth of aroids and other herbaceous plants in 900-1000 malt.	None at present	This palm species appears to be sensitive to exposure; habitat protection will ensure its natural regeneration, otherwise its flowering and fruiting behaviour may lead to its extinction. Its introduction in the botanical gardens for *ex situ* conservation and collection of viable seeds from the natural population are also suggested.	A palm of immense botanical interest. Can be grown as a very good ornamental plant in Palm houses and conservatories, etc.	None at present	1. Basu, S. K. (1976). A note on *Asraoa triandra* (Palmae). *Principes* 20:119. 2. Joseph, J. (1975). *Asraoa triandra* (Arecaceae)-A new genus and species of palm from Lohit District, Arunachal Pradesh. *Bull. Bot. Surv. India* 14: 144. figs. 1-5.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

13	*Catamixis baccbaroides* Thoms	The plant occurs in semi-arid conditions in high altitude calcareous cliffs of Garhwal Himalayas. The plant is seen on steep dry and exposed rocky slopes	None	(a) Curtailment or judicious quarrying and mining activities in the region to mitigate large-scale destruction of natural forest cover, (b) *ex situ* introduction and cultivation of the plants in reserves under similar ecological conditions.	The flowering and fruiting period is between March-May. The flowers (in white heads) remain in bloom for a very short period. This chasmophyte is of botanical interest and of indicator value.	Not known in cultivation	1. Bhattacharya, U. C. & Goel, A. K. (1982): *Rep. Rare or unknown Pl. Garh. Himal..,* pp. 35. Botanical Survey of India. 2. Jain, S. K. & Sastry, A. R. K.. (1980): *Threatened Plants of India. A State-of-the-Art Report.* BSI & MAB, New Delhi. p. 18. 3. Thomson, T. (1866): On two new genera of Compositae, Mutisiaceae from India. *J. Linn. Soc. Bot.* 9 : 343, t.4.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
14	*Inula kalapani* Clarke	It grows in open sunny areas near water sources in association with grasses, etc., and completes its life-cycle before winter approaches.	None on record	Efforts have to be made to rehabilitate this species in the reserved forests	A perennial herb of botanical interest. Flowers in June-July.	Not known in cultivation	1. Clarke, C. B. (1876). *Compo Ind.,* p. 123. 2. Hooker, J. D. (1881). *Fl. Brit. India* 3:295.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
15	*Lactuca benthamii* Clarke	In open alpine meadows from 4000 to 5000 m; fls. & frts.: August-September.	None so far	Intensive field surveys should be undertaken in the type locality and adjacent areas. After relocating this species, all efforts should be made to protect this plant in its natural habitat.	An endemic species of botanical interest. Its potential values are yet to be assessed.	So far not known	1. Clarke, C. B. (1876). *Compo Ind.,* p. 273. 2. Hooker, J. D. (1881). *Fl. Brit. India* 3:411.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
16	*Lactuca cooperi* Anthony	Alpine and sub-alpine regions in exposed hill slopes, *ca* 5000 malt.	None so far.	Intensive field surveys should be undertaken in the type locality and other adjacent areas for relocating the species; efforts should be made to protect the species in its natural habitat by declaring the type locality as protected; introduction of the species in the proposed Kanchendzunga Biosphere Reserve in north Sikkim.	Being an endangered and endemic plant, this species is of great botanical interest. Studies on the economic value are not known.	Not known so far	1. Anthony (1934). Diagnoses specierum novarum. *Notes Roy. Bot. 198.*	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

17	*Lactuca filicina* Duthie ex Stebbins	In open grassy meadows. Fls. & Frts.: September	None so far	Intensive field surveys should be undertaken in the type locality as well as similar habitats in adjacent areas for relocating this species; efforts should be made for protecting this species in its natural habitat. If there is any threat of its extinction, the species should be carefully introduced into gardens and after multiplication efforts should to rehabilitate in its type locality.	An endemic species of botanical interest. The species with fern-like foliage is quite distinct.	Not known so far	1. Stebbins, G. L. (1939). Notes on some Indian species of *Lactuca. Ind. For. Rec. (N.S.) Bot.* 1:241.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
18	*Lactuca undulata* Ledeb.	In open meadows of the high altitudinal areas.	None so far	Intensive search for the species in the region and adequate protection to its natural habitat is the only suitable measure.	Apart from its botanical interest, nothing more is known.	So far unknown.	1. Ledebour, Carl F. von, (1830). *Ic. Fl. Ross.* 2:2 t.129. 2. Ledebour, Carl F. von, (1833). *Flora Altaica* 4:156.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
19	*Saussurea clarkei* Hook. f.	On open slopes and meadows, amidst grasses in the alpine regions in the altitude of 4000-4500 m.	None so far.	Intensive field work to relocate its populations in the high altitude region, and protection of its natural habitat for *in situ* conservation.	Of Botanical interest; flowers during August-September.	Not known.	1. Blatter, E. (1928). *Beautiful flowers of Kashmir* 1: 187. 2. Lipschitz, S. (1979). *Rod. Saussurea,* p. 209.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
20	*Berberis affinis* G. Don	In open slopes forming thickets at *ca* 2500 malt	None so far, not even listed in the threatened plants catalogues so far published.	Field surveys should be undertaken to relocate this species in its type locality and similar adjacent habitats; the habitat of this species should be conserved; efforts be made for *ex situ* conservation.	Apart from botanical interest, other uses of this are not known; most species of *Berberis* are of medicinal value.	Not known in cultivation so far; but efforts should be made to study the ecological requirements of this species.	1. Ahrendt, L. W. A. (1961). *Berberis* & *Mahonia:* A Taxonomic Revision. *J. Linn. Soc. London* 57: 1-410	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

21	*Berberis kashmiriana* Ahrendt	Amidst Juniper scrub on south facing slope of the valley at 2500 m altitude.	None so far.	The type locality should be carefully surveyed for locating this species. The species should be conserved in *situ* by protecting the habitat and the plants.	Not studied; other species of *Berberis* are of medicinal value	Not so far brought under cultivation	1. Ahrendt, L. W. A. (1961). *Berberis* & *Mahonia:* A Taxonomic revision. *J. Linn. Soc. London* 57: 1-410. 2. Jafri, S. M. H. (1975). *Fasc. Fl. W. Pakistan* 87: 1-31. 3. Hajra, P. K. (1983). *In:* Jain, S. K. & Sastry, A. R. K. (ed.). *Materials for a Catalogue of threatened plants of India.* Botanical Survey of India, Howrah. p. 50. 4. Hajra,P. K. (1984). *In:* Jain, S. K. & Sastry, A. R. K. (comp.). *The Indian Plant Red Data Book-I.* Posscef, Botanical Survey of India, Howrah. p. 53.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
22	*Berberis lambertii* Parker	In the altitude of *ca* 2600 m, in association with *Berberis chitria*	None, but listed in Plants of North-Western Himalaya with restricted distribution (2), stating its vulnerability.	The species should be conserved in nature. The type locality of this species is in between Humidhura and Ratapani. It has been mentioned as growing in association with *Berberis chitria;* hence this locality should be carefully surveyed for relocating this species. Similar habitats, where *Berberis chitria* grows should also be searched.	No studies have been made for this species, however some other species of the genus are of medicinal value.	Not cultivated	1. Ahrendt, L.W.A. (1961). *Berberis* & *Mahonia:* A Taxonomic Revision. *J. Linn. London* 57: 1-410. 2. Hajra, P.K. (1983). Plants of North-Western Himalayas with restricted distribution- A census. *In:* Jain, S.K. & Rao, R.R. (ed.). *An Assessment of Threatened Plants of India.* Botanical Survey of India, Howrah. pp. 1-22. 3. Hajra, P.K. (1984). *In:* Jain, S.K. & Sastry, A.R.K. (ed.). *The Indian Plant Red Data Book-I.* Posscef, Botanical Survey of India, Howrah. p. 54.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
23	*Berberis osmastonii* Dunn	Open dry, hill slopes at higher altitudes.	None so far, but included in the list: 'Plants of North-Western Himalayas with restricted distribution (2).	This species should be searched in the type locality and depending upon the population size, the area may be declared as protected.	Not known as far	Not known.	1. Ahrendt, L. W. A. (1961). *Berberis* & *Mahonia:* A Taxonomic Revision. *J. Linn. Soc. London* 57: 1-410. 2. Hajra, P. K. (1983). Plants of North-Western Himalayas with restricted distribution-a census. *In:* Jain S. K. & Rao, R. R. (ed.). *An Assessment of Threatened Plants of India.* Botanical Survey of India, Howrah. pp. 1-12.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
24	*Arenaria curvifolia* Majumdar	Rocky slopes at 3350-3650 m, with *Arenaria depauperata* (Edgew.) Hara, and herbaceous species of Primulaceae, Rosaceae, etc.	None so far	If population is re-discovered at or near the type locality, efforts may be made to protect them in the natural habitat.	Produces white flowers in August-September. Potential value is not known.	Not known to be in cultivation	1. Majumdar, N. C. (1980). *Blumea* 26: 445-448.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
25	*Arenaria ferruginea* Duthie ex Williams	Grows amidst rocks in the Himalayan valleys at 2100-3000 m, with *Silene kumaonensis* Williams and other herbaceous species.	None so far	Intensive search in the type locality may help to find out some populations of the species. Proper care is needed to promote survival of the species in the original habitats.	Not known	Not cultivated.	1. Strachey, (1918). *Cat. Pl. Kumaon,* p. 20. 2. Williams, F. N. (1898). *J..Linn. Soc. Bot.* 33: 410.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

26	*Areneria thangoensis* Smith	Alpine region of Sikkim Himalaya, grows with other species of *Arenaria, Primula, Rhododendron,* etc.	None so far.	Explorations should be conducted in the original habitat for rediscovery of the plant. If found out, it may be protected in original habitat.	Not known.	Not cultivated	Smith, W. W. (1911). *Rec. Bot. Surv. India* 4: 180.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
27	*Carex munroi* Clarke	Occurs at an alt. of 3505 m	None on record.	The type locality should be thoroughly explored for locating the species for suitable conservation measures.	The species is of botanical importance. This species has been mentioned as a rare and little known taxon by Juyal & Bhattacharyya (3).	Not known	1. Clarke, C. B. (1894). *In:* Hooker, J. D., *Fl. Brit. India* 6: 699-748. 2. Kuekentha1, G. (1909). *In:* Engler, A., *Pflanzenr. Heft* 38:1-628. f. 1-128. 3. Juyal, N. & Bhattacharyya, U. C. (1983). Rare and little known taxa of *Carex* Linn. from N. W. Himalaya. *In:* Jain, S. K. & Rao, R.R. (ed.). *An Assessment of Threatened plants of India.* Botanical Survey of India, Howrah. pp. 26-27.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
28	*Cerex repanda* Clarke	In hills, warm to fairly cold humid climate, in 1000-1700 malt.	None on record	Locating the species in the wild, and if found, to protect the area, and also to introduce it in protected reserves and in the Botanic Gardens.	A species of botanical interest. Flowering and fruiting in May-June.	Not known	1. Clarke, C. B. (1894). *In:* Hooker, J. D., *Fl. Brit. India* 6: 720. 2. Clarke, C. B. (1898). *J. Linn. Soc.* (Bot.) 34: 120. 3. Kuekenthal, G. (1909). *In:* Engler, A., *Pflanzenr. Heft* 38: 288. 4. Rao, A. S. & Verma, D. M. (1982). *Cyperaceae of north-east India.* Botanical Survey of India, Howrah. p. 75.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
29	*Microschoenus duthiei* Clarke	The type was collected at 4572-4876 m. alt., in the sub-alpine areas. Not much information is available.	This species is mentioned as a rarely known plant (Juyal & Goel, 1982; Hajra, 1983).	The species should be searched in its type locality for it has not been collected elsewhere in the Western Himalaya.	The species is of botanical importance. Monotypic with very much localised distribution as is known at present.	Not known	1.Clarke, C. B. (1894). *In:* Hooker, J. D., *FI. Brit. India* 6: 585-672. 2.Clarke, C. B. (1909). *Illustrations of Cyperaceae.* tt. 1-114. 3. Juyal, N. & Goel, A. K. (1982). Some rarely known sedges from N.W. Himalaya. *J. Econ. Tax. Bot.* 3: 313-314. 4. Hajra, P. K. (1983). Threatened Plants of Western Himalaya with restricted distribution- A. census. *In :* Jain, S. K. & Rao, R. R. (ed.). *An Assessment of Threatened Plants of India.* Botanical Survey of India, Howrah. pp. 1-12.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
30	*lxonanthes khasiana* Hook. f.	In sub-tropical high rainfall forests along with other evergreen trees, in the altitudes of about 1000-1500 m.	None so far.	Efforts should be made to determine the extent to which this species occurs; collection of a few plants and multiplication from seeds in botanic gardens, and preservation of its habitats.	Flowers during April-May. Wood is suitable for cabinet work. This is the only species of the family known from India.	Not known	1. Hajra, P. K. (1983). Linaceae & Ixonanthaceae. *Fasc. Fl. India* 13: 14, t. 1-3. Botanical Survey of India. Howrah. 2. Kanjilal, U., *et al.* (1936). *Fl. Assam* 1(2): 186.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
31	*Eremurus himalaicus* Baker	A hardy perennial herb found in temperarate, dry, open grasslands and hill sides in Kashmir and Himachal Pradesh at an altitude of 2400-3300 m.	None so far	Conservation of its populations in its natural habitats. The species be introduced for cultivation in Botanic gardens and conservatories.	The species readily propagates by seeds or by division of rootstock. Also, ornamental for its white flowers; leaves are used as vegetable in Lahul, Himachal Pradesh (I).	Reported to be widely cultivated in gardens in Europe and America.	1. Bor, N. L. (1941). *Ind. For. 67: 629* . 2. Collet, H. (1902). *Fl. Simlensis, 525.* 3. Hooker, J. D. (1892). *Fl. Brit. India 6: 332.*	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

32	*Lilium macklineae* Sealy	It grows in open grassy hilly slopes and in rock crevices. The under- ground bulbs are devoid of leaves during winter. The new shoots with leaves bear flowers at apices.	At present, the Forest Department of Manipur has declared the Shirhoy hill as a National Park for *in situ* conservation of this lily.	Earlier effort to cultivate this species was not successful. However, a few bulbs were collected from wild (ca 2700 m) and planted at "Woodlands Compound" of Botanical Survey of India, Shillong (ca 1500 m). They survived and flowered for the last two seasons. An attempt be made to multiply it on large scale by seed culture, to meet demands.	The species with its bell-shaped pinkish-white flowers is of horticultural value. Flowers in May-June.	It can be grown from bulbs collected from wild under proper care. A few plants are under cultivation at "Woodlands Compound", Botanical Survey of India, Shillong.	1. Sealy, (1949). *Journ. Roy. Hort. Soc., London* 74: 349. t. 116-118	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
33	*Michelia punduana* Hook. f. *et.* Thorns.	It prefers open sunny places, in thick moist virgin forests.	None	It is depleting fast due to loss of habitat. It is likely that it may be surviving in the sacred and reserve forests. Efforts should be made to and introduce it in botanical gardens.	Botanical interest and timber value; flowering from October- January.	Not known in cultivation.	1.Balakrishnan, N. P. (1981). *Fl. Jowai* 1: 59. Botanical Survey of India, Howrah. 2. Hooker, J. D. (1872). *Fl. Brit. Jndia* 1: 43. 3.Kanjilal, U. N. *et at*. (1934). *Fl. Assam* 1: 23.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

34	*Anoectocbilus tetraptems* Hook. f.	*Anoectochilus* species are found in forest glades usually close to streams and on moss covered boulders, often forming beautiful carpets. The decaying leaves on the forest floor provide humus on which it grows and the mosses help in retaining moisture and preventing the plants from dessication. The habitats allow fresh air movement and is in " no way "stuffy".	This accidental rediscovery after eight decades and its first introduction to cultivation has not proved successful, and I know of no specific measures that have been undertaken that would in anyway help this species for its survival.	(1) Ban on *jhuming* and felling in its area of occurrence. *Thoughjhuming* was officially banned in India in 1976 (4), it should be noted that not much success has been attained in enforcing the ban on the local population. (2) Introducing it to cultivation as a matter of extreme urgency and propagating it artificially from seeds or through tissue culture methods.	An exquisite plant with glistening velvety leaves run over by 5 yellowish-white nerves. The leaves resemble those of *Haemaria discolor* (Ker-Gawl.) Lindl., but the flowers are entirely different. It was Sir Joseph Hooker (1), who, based on this species deduced that *Odontochilus* and *Anoectochilus* were congeneric by the following remark: "From the shortness of its spur this species of *Anoectochilus* approXimates nearest of all to *Odontochilus,* and tends to invalidate the very artificial character by which these genera are kept apart-namely, that in the former genus the spur, even if reduced to a sac is exposed, whereas in *Odontochilus* the sac is concealed by the bases of the lateral sepals and hence from a mentum". It is also the only *Anoectochilus* species with a divaricate apical lobes of lip. The species of this genus are commonly called as 'Jewel orchids'.	Not known.	1. Hooker, J.D. (1893). *Ic. Pl.* t. 2160. Hooker, J.D. (1890). *Fl. Brit. India 6: 96* . Pradhan, U.C. (1976). *Indian Orchids: Guide to Identification and Culture* 1:125. Pradhan, U.C. (1977). Conserving Indian Orchids. *Amer. Orch. Soc. Bull. 46(2): 119.* Pradhan, U.C. (1985). Himalayan Plant Red Data Sheets- 6. *Himalayan Plant Jour. 3(5).*	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
35	*Aphyllorchis gollani* Duthie	Reported in the altitudes of 2,500-3,000 m in shady forest floors.	None so far except that the export of all species of Orchidaceae from the wild has been banned under the CITES Convention.	It is necessary to search for the plant intensively similar type of habitats in adjacent regions during its flowering season.	Flowers in August. It is of considerable botanical interest.	Not known.	1. Duthie, J. F. (1902). *J. As, Soc. Beng.* 71: 42. 2. Duthie, J. F. (1906). Orchids of the North-Western Himalaya. *Ann. Roy. Bot. Garl Calcutta* 9(2) : 155, t. 122. 3. Hajra, P. K. (1983). Rare, threatened and endemic plants of Western Himalayas-Monocotyledons. *Plant Conservation Bulletin* 4:2. 4. Seidenfaden, G. & Arora, C. M. (1982). An enumeration of Orchids of Northwestern Himalayas. *Nord. Journ. Bot.* 2:9.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
36	*Archineottia microglottis* (Duthie) Chen	Grows in shady forest floor of *Quercus* and *Rhododendrol* munity.	None so far.	Relocating the species and preservation of its natural habitats.	Pale-green flowers appear during August-September . Botanical interest.	Not known	1. Duthie, J. F. (1906). The Orchids of North-Western Himalaya. *Ann. Roy. Bot. Calcutta* 9(2): 154. t. 120. 2. Pradhan, U. C. (1976). *Indian Orchids* : *Guide to Indentification and Culture* 1: 129. 3. Raizada, M. B. *et al.* (1981). *Orchids of Mussoorie,* p. 46. Debra Dun. 4. Seidenfaden, G. & Arora, C. M. (1982). An enumeration of Orchids of North-Western Himalaya. *Nord. Journ. Bot.* 2: 9.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

37	***Coelogyne treutleri*** Hook. f.	Not known. Probably epiphytic like the other species of *Coelogyne*	None for the species; the family Orchidaceae is included in App. II of CITES.	An attempt should be made to locate the species in wild; if located the natural habitat and its population should be conserved through *in situ* measures; steps for *ex situ* conservation should be taken.	Not known	Not known	1.Hooker, J. D. (1890). *Fl. Brit. India* 5: 837. 2.Hooker, J. D. (1892). *Icon. PI.* t. 2105. 3. Pfitzer, E. & Kranzlin, F. (1907). *In* Engler, A., *Das Pflanzenreich* 32:38. 4. Das, S. & Jain, S. K. (1980). *Fasc. Fl. India.* Botanical Survey of India, Howrah. 5:32.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
38	*Cymbidium eburneum* Lindl.	An epiphyte or lithophyte found growing at an elevation of 1000- 1500 m, in cool humid forests with moderate rainfall.	It is included in Appendix 2 of 1973 Convention on International Trade in Endangered species of Wild Fauna and Flora (CITES).	Propagation through seed and meristem culture should be undertaken on priority basis and plants be introduced in Orchid Sanctuaries and Orchidaria	It is an ornamental species with erect spikes bearing one to three large white, scented flowers of long lasting quality suitable for cut-flowers trade. It has potential in breeding and plant improvement for the production of quality flowers in Orchid industry. Flowers in March-April.		1. Hegde, S. N. (1984). *Orchids of Arunachal Pradesh.* Arunachal Forest Department, Itanagar. 2. Hooker, J. D. (1890). *Fl. Brit. India* 6:11. 3. Kataki, S. K., Jain, S. K. & Sastry, A. R. K. (1984). *Threatened and Endemic Orchids of North-Eastern* India. POSSCEF, B.S.I., Howrah. p. 27, t. 20. 4. King, G. & Pantling, R. (1898). The Orchids of Sikkim Himalaya, *Ann. R. Bot, Gdn., Calcutta.* . 5. Lindley, J. (1847). *Bot. Reg.* t. 67. 6. Pradhan, U. C. (1979). *Indian Orchids: Guide to identification and culture* 2. Kalimpong, India.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
39	*Cymbidium hookerianum* Reichb. f.	An epiphyte or lithophyte found in the Himalayas from Kumaon eastwards upto Arunachal Pradesh at elevations ranging from 1700-2500 m. Generally seen on large *Quercus* trees in huge clumps. The species can survive severe winter with snow- fall. During summer months, it can tolerate high humidity and prefers moderate rain fall.	This species is included in Appendix 2 of 1973 Convention on International Trade in Endangered species of Wild Fauna and Flora. The species is also under cultivation in the Orchidaria at Tipi and Dirrang and has also been introduced into the Orchid Sanctuary at Sessa, in Arunachal Pradesh.	Propagation through seed and tisssue-culture should be taken up on priority.	This species is found in sub-tropical and temperate Himalayas, with cool and humid climate. The plants are robust producing large fragrant flowers of long-lasting quality. The species has been used extensively in horticulture for breeding and has ornamental value. Flowering: February, upto May.		1. Hegde, S. N. (1984). *Orchids of Arunachal Pradesh.* Arunachal Forest Department, Itanagar. 2. Hooker, J. D. (1890). *Fl. Brit. India* 6:11. 3. Kataki, S. K., Jain, S. K. & Sastry, A. R. K. (1984). *Threatened and Endemic Orchids of North-Eastern India.* POSSCEF, Botanical Survey of India, Howrah. p. 28, t. 21. 4. King, G. & Pantling, R. (1898). The Orchids of Sikkim Himalaya. *Ann. R. Bot. Gdn., Calcutta,* 8: 192. t. 256.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

40	*Cypripedium elegans* Reichb. f.	In shady places or on open hill slopes, near springs along with species of *Cotoneaster, Saxifraga, Lactuca,* etc.	Nanda Devi National Park and the Valley of Flowers National Park include some of the habitats of the species, and are protected. Its export has been banned under CITES	Multiplication by tissue culture method and subsequent reintroduction in its habitats where it is depleted are proposed.	An attractive ground orchid and is of scientific and horticulture interest. Flowers in June.	Not known. Possibly grown in some European gardens	1. Hajra, P. K. (1983). *Botany of Nanda Devi National Park.* POSSCEF, Botanical Survey of India, Howrah. p. 30, f. 3A. 2. Kataki, S. K. (1984). *The Lady's slipper orchids of India.* POSSCEF, Botanical Survey of India, Howrah. 3. King, G. & Pantling, R. (1898). The orchids of Sikkim Himalaya. *Ann. Roy. Bot. Gard., Calcutta* 8 :341. t. 446. 4.Pradhan, U. C. (1976). *Indian Orchids: Guide to Identification and Culture* 1 :34. 5. Rao, A. S. (1979). *Orchids of India,* p. 34. New Delhi. 6. Rau, M. A. & Rao, T. A. (1960). *Bull. Bot. Surv. India* 2:425. 7. Seidenfaden, G. & Arora, C. M. (1982). An enumeration of the Orchids of Northwestern Himalayas. *Nord. Journ. Bot.* 2:12.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
41	*Cypripedium himalaicum* Rolfe	On open hill slopes or amidst *Cotoneaster, Parnassia* bushes in the subalpine and alpine meadows.	Its export has been restricted as Orchidaceae is in Appendix 2 of CITES; declaration of Nanda Devi as a National Park has given protection to some of its habitats.	Conservation of its habitats for *in situ* protection; tissue culture for multiplication of the species, and cultivation in National Orchidaria are proposed.	Flowers during July-Aug., and it is of horticultural and botanical interest.	Only a few plants are being cultivated in Orchidaria and orchid nurseries.	1.Hajra, P. K. (1983). *Botany of Nanda Devi National Park.* POSSCEF, Botanical Survey of India, Howrah. p. 30, t. 3b. 2. Jain, S. K. & Sastry, A. R. K. (1980). *Threatened plants of India. A state-of-the-Art Report.* BSI & MAB., New Delhi. p. 19. 3. Kataki, S. K. (1984). *Lady's slipper Orchids of India.* Botanical Survey of India, Howrah. 4. King, G. & Pantling, R. (1898). Orchids of Sikkim Himalayas. *Ann. Roy. Bot. Gard., Calcutta* 8 :342. t. 448. 5. Pradhan, U. C. (1976). *Indian Orchids: Guide to Identification and Culture* 1 :35. 6. Rao, A. S. (1979). *Orchids of India,* p. 34. New Delhi. 7. Seidenfaden, G. & Arora, C. M. (1982). An enumeration of the orchids of Northwestern Himalaya. *Nord. Journ. Bot.* 2:12.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
42	*Didiciea cunninghamii* King *et* Prain ex King *et* Pantling	In sub-alpine to alpine Himalayas	The recent declaration of Valley of Flowers as a National Park now offers protection to some of the habitats of the species.	Cultivation in the National Orchidaria, multiplication by tissue culture method and subsequent reintroduction in its natural habitats.	An interesting monotypic orchid of botanical interest.	Not known	1.Jain, S. K. & Sastry, A. R. K. (1980). *Threatened Plants of India. A State-of-the-Art eport.* BSI & MAB., New Delhi. 2.Kataki, S. K., Jain, S. K. & Sastry, A. R. K. (1984). *Threatened and endemic Orchids of Sikkim and North-eastern India.* POSSCEF, Botanical Survey of India, Howrah. p. 48. 3.King, G. & Pantling, R. (1898). The orchids of Sikkim Himalayas. *Ann. Roy. Bot. Gard. a/cutta* 8 :38. t. 50. 4.Pradhan, U. C. (1979). *Indian Orchids : Guide to Identification and Culture* 2: 437. 5.Rau, M. A. & Bhattacharyya, U. C. (1966). *Bull. Bot. Surv. India* 8: 94. t. 1-7. 6.Seidenfaden, G. & Arora, C. M. (1983). An enumeration of orchids of Northwestern .Himalaya. *Nord. Journ. Bot.* 2: 14.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

43	*Diplomeris hirsuta* (Lindl.) Lindl.	On moist rocks along with mosses and liver-worts in cool, shady places.	Its export has been banned under CITES as the family Orchidaceae is included in Appendix 2; this species has been included in the IUCN Plant Red Data Book.	MultiplicatIon of plants by tissue culture method, and reintroduction of the plants In similar type of habitats In Its distribution range.	A delicate plant with white flowers and is of horticultural value and botanical interest.	Reported to be cultivated in some private orchid nurseries	1. King, G. & Pantling, R. (1898). The Orchids of the Sikkim Himalaya. *Ann. Roy. Bot. Gard. Calcutta* 8 :337, t. 443. 2. Pradhan, U. C. (1974). *Diplomeris hirsuta* (Lindl.) Lindl. A survey. *Am. Orch. Soc. Bull. 43(6) : 525-528.* 3. Pradhan, U. C. (1979). *Indian Orchids: Guide to Identification and Culture* 1 :43. 4. Rau, M. A. & Arora, C. M. (1972). On the Occurrence of *Diplomeris hirsuta* Lindl. (Orchidaceae) in Western Himalaya. *Bull. Bot. Surv. India* 15:138-139.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
44	*Diplomeris pulchella* D. Don	It grows on moist moss covered rocks or on old tree stumps covered with moss near water sources which ensure humidity.	The areas, i.e., Balphagram in Garo Hills and Namdapha in Tirap District are now Wild Life sanctuaries; all the species of Orchidaceae are included in the Appendix 2 of the 1973 Convention on International Trade in Endangered species of Fauna and Flora (CITES). The IUCN Plant Red Data Book includes *D.hirsuta* from India.	It is proposed that the plants be-brought under cultivation in similar protected places and also to discourage people from collecting this species.	A beautiful white-flowered species of botanical interest and restricted occurrence. Flowers during August-September.	Not known in cultivation	1. Hooker, J. D. (1890). *FI. Brit. India* 6:167. 2. Kataki, S. K., Jain, S. K., & Sastry, A. R. K. (1984). *Threatened and Endemic Orchids of Sikkim and North-eastern India.* POSSCEF, B.S.I., Howrah. p. 49, t. 38	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
45	*Eria occidentalis* Seid.	Epiphytic, in *Quercus* forests	None so far	Its distribution area should be declared as an orchid sanctuary, and the species should be introduced into the National Orchidaria.	A species of botanical and distributional interest. Flowers from July-August.		1.Seidenfaden, G. *In:* Seidenfaden, G. & Arora, C. M. (1982). An enumeration of orchids of the North Western Himalaya. *Nord. Journ. Bot.* 2: 15.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
46	*Flickingeria hesperis* Seid.	Usually epiphytic on *Englehardtia spicata,* in forests	None so far	The Gouri River valley in Pithoragarh district, Uttar Pradesh should be declared as an orchid sanctuary as the locality is rich in orchids and is very near to human settlements. Lopping and felling of the trees should be totally banned in these, forests.	The species is of distributional importance due to its ende- , micity and rarity. Flowers during August-September.	The plant is recently brought under cultivation into the Orchid House of the Botanical Survey of India, Dehra Dun.	1. Seidenfaden, G. *In:* Seidenfaden, G. & Arora, C. M. (1972): An enumeration of orchids of the North Western Himalaya. *Nord. Jour. Bot.* 2:15.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

47	*Paphiopedilum insigne* (Wall. ex Lindl.) Pfitz.	Grows along open hilly slopes and in rock crevices in open forest floors. Its distribution areas receive high or moderately high annual rainfall. The soils are rich in humus and are well drained.	None for its natural habitats; the family Orchidaceae is included in the Appendix 2 of the CITES. A few plants are being reared in the National Orchidaria of the Botanical Survey of India at Shillong and Yercaud.	Immediate steps to declare its distribution localities in India (also in Nepal and Bangladesh) as protected sanctuaries be taken up; its plants be multi- plied through seed germination and meristem culture in the Orchidaria and reintroduced into its natural habitats; complete ban on collection of its natural populations be enforced.	A very beautiful Slipper orchid of horticultural value. The flowers appear during October-December. Paphiopedilums have been in demand in horti- culture and several hybrids have been developed.	The species is in cultivation in several orchidaria and in orchid nurseries all over the world. A few plants have been introduced into the National Orchidaria of the Botani- cal Survey of India at Shillong and Yercaud and are thriving well.	1. Kataki, S. K. (1984). *Lady's Slipper Orchids of India.* POSSCEF, Botanical Survey of India, Howrah. p. 13, t. 4. 2. Kataki, S. K., Jain, S. K., & Sastry, A. R. K. (1984). *Threatened and Endemic Orchids of Sikkim and North-Eastern India.* POSSCEF, Botanical Survey of India, Howrah. 3. Kataki, S. K. (1986). *Orchids of Meghalaya.* Govt. of Meghalaya, Shillong. p. 227. 4. King, G. & Pantling, R. (1898). The Orchids of Sikkim Himialaya. *Ann. Roy. Bot. Gard. Calcutta* 8.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
48	*Paphiopedilum venustum* (Wall. ex Sims.) Pfitz.	It grows in moist shady areas preferably near water sources. It is seen growing together with *Selaginel/a* sp.	Specifically none. The family Orchidaceae is included in Appendix 2 of the 1973 Convention on International Trade in Endangered species of wild Fauna and Flora.	The species is rather difficult to cultivate unlike the other species of *Paphiopedilum.* The destruction of its habitats has been the main causative factor for its fast depletion. An effort has to be made to protect its natural habitats for multiplica- tion and self propagation.	A delicate, ornamental species; flowers during December- February	Plants are seen under cultivation in some gardens. It thrives best in the media of leaf mould, sand and powdered charcoal in the proportion of 8:1:1. Frequent watering is essential to keep the media moist.	1. Hooker, J. D. (1890). *Fl. Brit. India* 6: 173. 2. Kataki, S. K. (1984). *Lady's slipper orchids of India.* POSSCEF, Botanical Survey of India, Howrah. 3. Kataki, S K., Jain, S. K., & Sastry, A. R. K. (1984) *Threatened and Endemic Orchids of Sikkim and North-Eastern India.* POSSCEF, Botanical Survey of India, Howrah. p. 75, t. 60. 4. Kataki, S. K. (1986). *Orchids of Meghalaya.* Government of Meghalaya, Shillong. p. 227. 5. Pradhan, U. C. (1976). *Indian Orchids: Guide to Identification and Culture* 1: 40.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

49	*Paphiopedilum wardii* Summerh	Reported to grow in open, on grantic rocky surfaces covered with mosses and leaf-litter	All the species of Orchidaceae are included in Appendix 2 of the 1973 Convention on International Trade in Endangered species of wild Fauna and Flora.	Intensive search has to be made to relocate this species in wild, in Lohit district and in other possible adjoining regions.	An ornamental species flowering in winter months (December-February).	Not known under cultivation	1. Kataki, S. K. (1984). *Lady's Slipper Orchids of India.* POSSCEF., Botanical Survey of India, Howrah. p. 6. 2. Pradhan, U. C. (1976). *Indian Orchids: Guide to Identification and Culture* 1: 40.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
50	*Pleione lagenaria* Lindl.	Like other species of *Pleione,* it also grows as an epiphyte on trees or as an epilith on moss covered rocks.	None so far, except that Orchidaceae is included in the Appendix 2 of CITES Convention which bans export of wild orchids.	Repeated search has to be made to locate this species in wild, particularly during its flowering time, i.e., in October-November.	After its introduction in England, it has earned the highest repute amongst orchid amateurs on account of its beautiful flowers.	Not known in this region	1. Hooker J. D. (1890). *Fl. Brit. India* 5: 841. 2. Kataki S. K., Jain,S. K., & Sastry, A. R. K. (1984). *Threatened and Endemic Orchids of Sikkim and North-Eastern India.* POSSCEF, Botanical Survey of India, Howrah, p. 82. t. 67.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
51	*Renanthera imschootiana* Rolfe	In nature this species grows as an epiphyte on large broad leaved tree trunks in the alt. of 1000-2000 m high, preferably in sunny areas. Its distribution areas in India receive moderate to high rainfall of ca 250 cm.	None for the wild populations or its habitats; the species has been included in the threatened plants lists of India; the family Orchidaceae is included in the Appendix 2 of the CITES. A few plants have been introduced into the National Orchidaria of the Botanical Survey of India at Shillong and Yercaud.	Some of its distributional localities/areas in India should be conserved as a means of its in situ conservation; steps should be taken to check the possible removal of its natural populations; attempts should be made for large scale multiplication in orchidaria and botanical gardens to meet trade demands.	A beautiful climbing orchid of much ornamental value ; popularly called the 'Red Vanda', for its large, attractive, showy yellow-orange yellow, red- spotted petals and red-flushed lateral sepals.	A few plants are in cultivation in the National Orchidarium of the Botanical Survey of India, at Shillong, and reportedly in several other orchid nurseries and botanic gardens in India and abroad. The species grows well in pots and on ground in soil mixed with brick pieces, charcoal and humus and watered regularly during dry periods.	1. Jain, S. K. & Sastry, A. R. K. (1980). *Threatened Plants of India. A State-of-the-Art Report.* BSI & MAB. New Delhi. 2. Kataki, S. K. (1976). Indian orchids-A note on their conservation. *Amer. Orch. Soc. Bull.* 45: 912-913. 3. Kataki, S. K., Jain, S. K. & Sastry, A. R. K. (1984). Threatened and Endemic Orchids of *Sikkim and North-Eastern India*. POSSCEF, Botanical Survey of India, Howrah. 4. Pradhan, U. C. (1979*). Indian Orchids: Guide to Identification and Culture* 2: 523.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

52	*Zeuxine pulchra* King et Pantl.	Jewel orchids inhabit cool shady nooks close by streams and rivers, usually under thick undergrowth of shrubs and trees.	No specific measures taken, habitat destruction, natural calamities like landslides, etc could cause major damages.	(1) This species should be located in its habitat and the areas be given special protection. (2) It should be brought into cultivation and propagated artificially from seeds and cutting. (3) seeds should also be distributed to reputed international institutes who have facilities to stores them at low temperatures.	A high ornamental species with dark velvety brown leaves having a white mid-rib. The leaves are coriaceous and glisten in light. Its biology has not been properly understood. Flowering Time: August.	When some plants of this were received in my collection from Meghalaya in 1974, after nearly eight decades since its first discovery, I tried to maintain by providing cultural conditions a best as I could. However, the plants could not be kept for more than a year under greenhouse conditions.	1. King, G. & Pantling, R. (1898). Orchids of Sikkim Himalaya. *Ann. Roy. Bot. Gard. Calcutta* 8 : 286. t. 380. 2. Pradhan, U. C. (1976), *Indian Orchids: Guide to Identification and Culture* I: 117. 3. Pradhan, U. C. (1983). *Himal. Plant Journ.* 2(3): 17-19.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
53	*Pittosporum eriocarpum* Royle	A small tree or a large shrub, grows in rocky slopes in hot places and has been collected within the altitudes ranging from 1200 to 2400 m.	NO conservation measure has been taken to protect the species in its wild habitat so far.	It is proposed that before disappearance of this species, adequate measures be taken to protect them in its distribution localities. Thorough investigation be made to rediscover the plant in the wild state and it is necessary to collect seeds to propogate this beautiful small tree in gardens and road side avenues.	This beautiful species is characterised by tomentose stem, leaves and branches; ovate-oblong to oblong-lanceolate leaves; paniculate-corymbs, densely tomentose 2-valved capsules. The bark, aromatic when freshly cut is said to possess narcotic properties and is used locally in chronic bronchitis.	The species is not known so far in cultivation but may be introduced in gardens for the beautiful yellow flowers	1. Brandis, D. (1874). *For. Fl. India,* p. 19. 2. Duthie, J. F. (1903). *Fl. Upper Gang. Pl.* 1: 61. 3. Hajra, P. K. (1983). *In:* Jain, S. K. & Rao, R. R. (ed.) *An Assessment of Threatened Plants of India.* Botanical Survey of India, Howrah. p. 35. 4. Hooker, J. D. & Thomson, T. (1872). *Fl. Brit. India* 1: 199. 5. Royle, J. F. (1834). *Illustr. Bot. Himal.* 1: 77.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
54	*Deyeuxia simlensis* Bor	Nothing specific is known, except that its habitat falls in the temperate region in the Western Himalaya.	None.	Thorough search in the type locality and other adjoining areas for study of this grass and to suggest suitable conservation measures.	Not known.	Not known in cultivation.	1. Bor, N. L. (1941). *Ind. For. Rec . (N.S.) Bot .* 3(5): 149-150. 2. Bor, N. L. (1960). *The Grasses of Burma, Ceylon, India and Pakistan,* p. 400.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

55	*Sapria himalayana* Griff.	It grows in dense, undisturbed forests near 40 th mile in the proposed Namdapha Biosphere Reserve, in damp moist places on the roots of *Cissus elongata* and other species of Vitaceae, as a complete root parasite.	Its distribution area in Namdapha is a proposed Biosphere Reserve;	This species has to be conserved *in situ* in the Namdapha forest area which is under protection, as other means of conservation are difficult because of its parasitic habit.	A very interesting species of the family Rafflesiaceae with large flowers of *ca* 12-16 cm across, and of considerable botanical interest. Earlier it was reported from different parts of N. E. region, but is now confined only to the Namdapha forest area. The whole plant is represented by its flower; other parts much reduced or absent having its roots attached to the host plants. Flowers in December.	It is possibly very difficult to grow because of its host specificity in parasitism.	1. Deb, D. B. (1961): Dicotyledonous plants of Manipur territory. *Bull. Bot. Sur v. India* 3(3&4):318. 2. Griffith, W. (1844): *Proc. Linn. Soc.* 1: 216. 3. Hooker, J. D. (1886): *FI. Brit. India* 5: 71. 4. Jain, S. K. & Sastry, A. R. K. (1980): *Threatened Plants of India. A state-of-the-Art Report.* Botanical Survey of India & MAB., New Delhi. p.37. 5. Joseph, J. & Chauhan, A. S. (1983). *In:* Jain, S. K. & Sastry, A. R. K. (ed.) *Botany of some Tiger Habitats in India.* POSSCEF, Botanical Survey of India, Howrah. pp. 26-29. 6. Kanjilal, U.N" *et al* (1940). *FI. Assam* 4: 27.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
56	*Aconitum deinorrhizom* Stapf	Alpine Himalaya, in alpine meadows at alt. of 3000-4500 m.	None.	Collection of the species for commercial use from the .here wild should be banned and attempts to cultivate this species on large scale should be made.	FIs. and frts. : June-October. It is the principal constituent of' A. ferox' and is the chief Indian Aconite now exported	Not known in cultivation	1. Basu, B. D. (1918). *Indian medicinal plants,* Part I, t. 15. 2. Jain, S. K. & Sastry, A. R. K. (1980). *Threatened plants of India. A State-of-the-Art Report.* Botanical Survey of India & M.A.B., New Delhi. p. 12. 3. Stapf, O. (1904). *Aconites of India-A monograph,* p. 158, t. 103.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
57	***Aconitum ferox Wall***. ex Seringe	Temperate to alpine regions of Himalaya in the alt. of 3300-5000 m.	None specifically for this species although some of its habitats fall within some National Parks in the region.	Collection of this species from wild in bulk quantities should be banned. The species may be tried for cultivation in order to obtain plant material in sufficient quantities for commercial exploitation.	Fls. and Frts: July-November. It is a rare, poisonous species, used for curing many diseases and also used as arrow poison. The so called `A ferox' of Indian commerce or 'Indian Aconite', now available is a mixture of *A. deinorrhizum* and *A. balfourii.*	Not known in cultivation	1. Hooker, J. D. & Thomson, T. (1872). *FI. Brit. India* 1: 28. 2. Stapf, O. (1904). *Aconites of India-A monograph,* p. 169, t. 109, figs. 1-16.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
58	***Clematis apiculata*** Hook. f. *et* Thorns.	It grows in the sub-tropical forest areas and around water sources and on humus rich soils. During the growing period of June to October, the high rainfall coupled with optimum temperature facilitate this annual herb to grow profusely.	None.	(a) Mawsmai forest of Cherrapunji has been declared as reserve forest by the state forest department and an attempt should be made to rehabilitate this species in that area. The other area, i.e., Mamloo forest is completely destroyed for development of a cement factory .(b) Efforts are also being made to locate and rehabilitate this species in the Nongkhlow forest, another earlier known locality.	Not known, but an annual climber of botanical interest. However, the species with its foliage and flower clusters should be of horticultural importance. Flowers in July to August.	This species is not known in cultivation.	1. Hooker, J. D. (1872). *FI. Brit. India* 1: 2-6. 2. Kanjilal, U.N., *et al* (1934): *FI. Assam* 1 (I): 1-6. 3. Kapoor, S. L. (1962): *Bull. Nat. Bot. Gardn. Lucknow* 78: 1-67. 4. Kapoor, S. L. (1966): *Bull. Nat. Bot. Gardn. Lucknow* 124: 5-6. 5. Mukherjee, S. K. (1959): *Bull. Bot. Surv. India* 1(1): 138.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

59	*Cotoneaster simonsii Hort*. ex Baker	Restricted to temperate-subalpine altitudes (1545-3152 m) in Sikkim; it is a deciduous or semi-evergreen shrubby species quite hardy against frost.	None for the wild habitat	Lachung valley (3150 m) in Sikkim may be declared a protected area by the Government of Sikkim or the Central Government, not only for the protection of this species, but also for the rich potential germ-plasm endemic to the valley.	A semi-evergreen or deciduous shrub, to 4 m high is popular among the gardeners and horticulturists, not only for its shining leaves, 2-5 flowers per peduncle, but also for its bright scarlet red edible berries. It was introduced in England in 1860s and has been multiplied in cultivation eversince. In mild winters it retains many of its leaves until Christmas. It is an excellent shrub for massing and invariably produces berries freely. The species is named after Mr. Simmons, under the mistaken belief that the seeds of the species came .from Khasia Hills where Simmons was collecting plants at the time.	The species is easily propagated from its seeds, cuttings, layering, vegetative multiplication ensuring more efficient propagation and retention of quality. The species is an ideal horticultural attraction for the gardeners in temperate latitudes/altitudes. Frequently cultivated and occasionally naturalised in N. W. Europe.	1. Baker, J. G. (1869). Natural order Rosaceae, tribe Pomeae, genus *Cotoneaster. Refug. bot.* 1: t. 55. 2. Hooker, J. D. (1878). *FI. Brit. India* 2: 386. 3. Klotz, G. (1963). The *Cotoneaster* of the C. *nitidus* Jacquea Group. *Bull. Bot. Surv. India 5 (3 & 4): 208.* 4. Osborn, A. (1923). The genus *Cotoneaster. The Garden* 87: 42. 5. Rehder, A. (1940). *A Manual of cultivated trees and shrubs,* p. 349. (Second revised ed.): 6. Schneider, (1906). *Illus. Handb. Laubholzk.* I: 746, fig. 419, f.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
60	*Ophiorrhiza wattii* Fischer	On moist shady places at 600-1200 m in alt.	Nil	Efforts should be made to collect the plants and grow in botanic gardens. Some areas in the region rich in endemics and threatened plants should be protected.	A plant of academic interest, not thoroughly studied. Flowers and fruits during April-December.	Not cultivated anywhere	1. Fischer, C. E. C. (1940). *Kew Bull.* 1940: 34.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
61	*Picrorhiza kurrooa* Royle ex Benth.	Fleshy rooted perennial on rocky alpine slopes at 3300-5000 m altitude.	None.	Collection of this species from the wild should be banned. Attempts should be made to cultivate this important medicinal plant for its exploitation.	Fls. and Frts: June-September. Perennial herb with elongate, stout creeping rootstock, propagated by seeds and rhizomes. Widely used as a medicine in a large number of diseases and ailments.	Not known in cultivation.	1. Anon. (1969). *The Wealth of India: Raw materials* 8: 49. 2. Basu, B. D. (1918). *Indian Medicinal* Plants-Plates. Part III. t. 699. 3. Royle, J. F., (1839). *Illust. Bot. Himal.* 291. t. 71.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
62	***Sterculia khasiana*** Debbarman	This species was collected from the sub-tropical forests of the Khasi hills, in between 1000-1500 m alt.	None.	Efforts should be made to relocate them locality to raise plants from seeds in botanic gardens.	Uses and potential value of this species are not known. Flowers during May-June.	Not known in cultivation	1. Debbarman (1934): *FI. Assam.* 1(1): 154. 2.Debbarman & Biswas (1934): *Assam For. Rec. Bot.* 1 : 5.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

63	***Adinandra griffithii*** Dyer	It grows in the thick, moist virgin forests near Cherrapunji and Shongpung forests of Meghalaya.	Recently the Mawsmai forest area in Meghalaya has been declared as reserve forest by the State Government, which may help its protection in wild ,if introduced there.	Efforts are being made to relocate and rehabilitate this tree species.	An interesting species of the genus *Adinandra,* admirc horticulture due to the white fragrant flowers which bloom during April to June. Its timber is useful for furniture. .	Not known in cultivation	1. Balakrishnan, N. P. (1981): *Fl. Jowai* 1 : 94. Botanical Survey of India, Howrah. 2. Dyer, W. T. T. (1874). *In:* Hooker, J. D.; *Fl. Brit. India* 1 : 282. 3. Jain, S. K. & Sastry, A. R. K. (1980). *Threatened Plants of India. A State-of-the. Report.* B.S.I. & MAB. New Delhi. p. 12. 4.Kanjilal, U.N., *et al* (1934): *Fl. Assam* 1 : 177.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
64	***Dendroglossa minutula*** (Fee) Copel.	Grows in sandy river beds in between 600-1300 m alt. (3)	None.	Intensive search to recollect the species and to grow in Botanical Gardens.	No information.		1. Beddome, R. H. (1865). *The ferns of British India,* t. 116. 2. Beddome, R. H. (1883). *A Handbook to the ferns of British India, Ceylon and Malay Peninsula.* p. 430. t. 259. 3. Clarke, C. B. (1880) A review of ferns of N. India. *Trans. Linn. Soc. ser.2.* Bot. 1: 579. 4. Copeland, E. B. (1947). *Genera Filicum,* p. 199. 5. Fee, A. L. A. (1865) *Mem. Fam. Foug.* 8, t. 31, f. 2. 6. Hooker, W. J. (1864). *Species Filicum* 5: 277. 7. Hooker, W. J. (1861). *Second century of ferns,* t. 78. 8. Hooker, W. J. & Baker, J. G. (1867). *Synopsis Filicum,* p. 420.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
65	*Selaginella adunca* A. Br. ex Hieron.	On moss-covered rock boulders along streams and rivulets.	None.	(a) Collection of plant material should be stopped, (b) efforts should be made to introduce the species in conservatories.	It is one of the beautiful species of the genus. It is of much academic interest due to presence of two lateral veins in the lateral and median leaves.	Trials may be made to introduce the species in conservatories.	1. Alston, A. H. G. (1945). An enumeration of the Indian species of *Selaginella. Proc. Nat. Inst. Sci. India* 11: 211-235. 2. Dixit, R. D. (1979). *Taxonomic studies on the families Lycopodiaceae and Selaginellaceae in India.* Ph.D. Thesis, Calcutta University, Calcutta. 3. Dixit, R. D. (1983). Rare and interesting Pteridophytes of India-II. *In:* Jain, S. K. & Rao, R. R. (ed.) *An Assessment Threatened Plants of India.* Botanical Survey of India, Howrah.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
66	*Areneria thangoensis* Smith	Alpine region of Sikkim Himalaya, grows with other species of *Arenaria, Primula, Rhododendron,* etc.	None so far.	Explorations should be conducted in the original habitat for rediscovery of the plant. If found out, it may be protected in original habitat.	Not known.	Not cultivated	1. Smith, W. W. (1911). *Rec. Bot. Surv. India* 4: 180.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
67	***Fimbristylis stolonifera*** Clarke	In partly open moist places along forest margins in rather cold humid climate at about 1800 m.	None. However the Mawphlong forests are protected as 'sacred groves' by the local people due to religious belief.	Protection of its habitat from forest fires and grazing and introduction of the species in the Botanic Gardens.	A species of botanical interest. This is the only species of *Fimbristylis* Sect. *Fimbristylis* with long creeping rhizomes. Flowering and fruiting in May- June.		1.Clarke, C. B. (1893). *In:* Hooker, J. D., *Fl. Brit. India* 6: 637. 2. Clarke,C. B. (1898). *J. Linn. Soc.* (Bot.) 34: 59. 3. Rao, A. S. Verma & Verma, D. M. (1982). *Cyperaceae of north-east India.* Botanical Survey of India, Howrah. p. 32.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

68	*Cymbidium whiteae* King & Pantling	An epiphyte usually inhabiting trees of *Schima wal/ichii* and rarely on *Castanopsis,* at elevations of l500-l700m., in association with other species of *Cymbidium* and *Bulbophyl/um.* S. *wal/ichii* forest indicates poor soil and moisture condition (dry winters) and occur facing the southern apect.	On 8 July 1910, the then Chogyal of Sikkim under Forest Notification Memo. No. 375, banned the collection of Orchids in Sikkim. All species of *Orchidaceae* are in Appendix 2 of the Convention on International Trade in Endangered Species of Wild Fauna and Flora. However, a major threat to this species is habitat destruction owing to rapid urbanisation.	Complete cessation of felling in the area of its occurrence, and replenishing of original site. This species is self-fertile and hence can be easily propagated in cultivation by seeds in aseptic cultures and by meristem tissue culture. That a well ripe pod contains over 50,000 seeds per capsule, gives this species excellent chance of regenerating itself if the present habitat can be protected and planted.	It is a unique species in the genus *Cymbidium* in having purple-red dotted petals and could have great horticultural value in breeding "spotted" *Cym- bidium.* Flowering time: November. A species closely resembling C. *cochleare* Lindl., in the vegetative parts and easily confused.	In cultivation in a few nurseries and hobbyists in Kalimpong and Gangtok.	1. Kataki, S. K., Jain, S. K. & Sastry, A. R. K. (1984). *Threatened and Endemic orchids of* : *Sikkim and North-eastern India.* POSSCEF, Botanical Survey of India, Howrah. p.36. 2. King, G. & Pantling, R. (1898). The Orchids of the Sikkim Himalayas. *Ann. R. Bot. Gdn. Calcutta* 8: 193-194 t. 258. 3. Pradhan, U. C. (1979). *Indian Orchids: Guide to Identification and Culture* 2: p. 478.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
69	*Paphiopedilum fairrieanum* (Lindl.) Stein	It is reported to grow on crystalline limestone outcrops in sheltered grassy slopes, on moss-covered boulders in oak forest floors and on gneiss ledges amongst grasses in open well-drained gravelly areas near streams and rivers in the altitudes: 1400-2200 m. The area receives high rainfall during monsoon and is dry and cool for the rest of the year (1).	None for the wild plants; the family Orchidaceae is included in Appendix 2 of the CITES which restricts its export; it is also included in the threatened plants publications of the Botanical Survey of India (2 & 3).	Protection of its natural populations and habitats; *ex situ* conservation, multiplication and reintroduction of plants into original habitats are suggested.	A very elegant Lady's slipper orchid much valued in horticulture. It flowers during Oct.-January and the flowers have lasting quality. Some varieties and a natural hybird *(P. X pradhanii)* have been reported (4). It is popularly called the 'Asian Lady's Slipper Orchid' and the 'Lost Orchid'.	It is being cultivated in several orchidaria and botanic gardens of the world and in some private nurseries. Some plants of this are in cultivation in the National Orchidaria of the Botanical Survey of India at Shillong and Yercaud.	1. Cribb, P. (1985). *Paphiopedilumfairrieanum. Kew Bull.* 2(4): 351-354. t. 47. 2. Jain, S.K. & Sastry, A.R.K. (1980). *Threatened Plants* of *India. A State-of the-Art Report.* Botanical Survey of India & MAB Committee, New Delhi. p. 63. 3. Kataki, S. K. (1984). *Lady's Slipper Orchids of India.* POSSCEF, Botanical Survey of India. p. 18. 4. Pradhan, U. C. (1979). *Indian Orchids: Guide to Identification and Culture* 2:674.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

70	*Paphiopedilum spicerianum* (Reichb.f.) Pfitz.	Usually seen on calcareous limestone formations in shady situations in association with Globba sp. and ferns. The roots run on the surface of the rocks and also penetrate the substratum in places having humus, and where water has softened the substratum. In exposed places, the roots are covered by algae, and in such instances, often one can find seedlings growing along the roots. The area comes under heavy monsoon and receives torrential rains from July-September. From October-May, it derives moisture from mists arising from the rivers and pre-monsoon thundershowers. It grows on the limestone ledges with its leaves hanging down-most likely to drain off excess precipitation during the heavy monsoon period. It is pollinated in nature by hoverflies. (6 & 7).	None whatsoever for the natural habitat. All species of *Orchidaceae* are in Appendix 2 of the Convention on International Trade in Endangered Species of Wild Fauna and Flora. It is in cultivation.	(a) To declare the areas of its occurrence as protected places of scientific interest, and to restrict all human encroachment-specially *jhuming* in surrounding areas. It is also necessary to inclucate awareness among the armed forces and border security forces, so that its habitat may not be used for any kind of exercise. (b) To obtain all plants henceforth from seeds which are fairly easy to raise in the laboratory, or from divisions of the existing stocks. (c) Except for bonafide scientific research, no further collection should be allowed.	An important parent of nearly all modern *Paphiopedilum* Hybrids, this species has great horticultural significance in the fact that it has contributed its hardiness and bold dorsal sepal to most of hybrid Paphiopedilums. Its biology is not yet properly understood. Since some *Paphiopedilum* species like *P. villosm* (Lindl.) Pfitz., are known to contain alkaloids, this species too needs investigation. Flowers durig October-December.	Cultivated by hobbyists around the world as a favourite species among Paphiopedilums	1. Fowlie, J. A. (1970). *Paphiopedilum spicerianum-Lady* Spicer's Slipper orchid. *Digest* 34(2) :56 - 57. 2. Hooker, J. D. (1900). 3. Kataki, S. K. (1984). India Howrah. 4. Kataki, S. K., Jain, S. K. & Sastry, A. R. K. (1984) *Threatened and Endemic Orchids of Sikkim and North-Eastern India.* POSSCEF, Botanical Survey of India, Howrah. p. 71. t. 58. 5. Pfitzer, E. (1984). *Paphiopedilum spicerianum* (Reichb. f.) Pfitz. *In:* Engler's, *Bot. Jahrb.* 19 :41. 6. Pradhan, U. C. (1976). *Indian Orchids: Guide to Identification and Culture* 1:38. 7. Pradhan, U. C. (1976). Natural Hydrids of Indian Paphiopedilums. *Orchid Digest* 40(5): 185-190. 8. Riechenbach, H. G. (1980). *Cypripedium spicerianum. Gard. Chron.* 2:40, 363c. 9. van Delden, R. J. (1969). *Paphiopedilum spicerianum* (Reichb.f.) Pfitz., *Orchid Digest* 33(3):97.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

71	*Paphiopedilum villosum* (Lindl.) Stein	In dense forests on cool humus rich forest floors or sometimes on moss covered rockboulders and on trees as an epiphyte, in the alt. of 1200-1700 m. The area receives an annual rainfall of *ca* 250 cm on an average and is humid for a major part of the year.	None for the wild populations and natural habitats; how- ever the family Orchidaceae is included in the Appendix 2 of the Convention on International Trade in Endangered species of wild Fauna and Flora (CITES). The species has been listed in threatened plant lists of India and has also been recommended by the Botanical Survey of India, for inclusion in the schedules of the Wildlife Act of the Government of India.	*In situ* conservation of the wild populations and protection of its natural habitats; multiplication and propagation in orchidaria through seed germination, vegetative propagation and tissue culture method are suggested. "	It is one of the beautiful species among the Lady's slipper orchids and is much sought of in horticultural trade for the long lasting quality of the flowers. The species has also been used for developing hybrids.	From a few plants collected from Mizoram a few decades ago, the species has been vegetatively propagated and successfully multiplied in good numbers in pots and in plots, in the National Orchidaria of the Botanical Survey of India at Shillong and Yercaud.	1. Jain, S. K. & Sastry, A. R. K. (1980). *Threatened Plants of India. A State-of-the-Art Report.* BSI & MAB, New Delhi. p. 31. 2. Kataki, S. K. (1984). *Lady's Slipper Orchids of India.* POSSCEF, Botanical Survey of India, Howrah. p. 14. t. 5. 3. Kataki, S. K., Jain, S. K. & Sastry, A. R. K. (1984). *Threatened and Endemic Orchids of Sikkim and North-Eastern India.* POSSCEF, Botanical Survey of India, Howrah.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
72	*Pholidota wattii* King *et* Pantl.	Epiphytic on moss-covered trees along with other orchids like *Pholidota imbricata*	None for the species and its wild habitats. The family Orchidaceae is included in Appendix 2 of the 1973 Convention on International Trade in Endangered Species of wild Fauna and Flora.	Intensive search in its distribution range to locate the species; protection of its habitats.	A little known species mainly of botanical interest; flowers: May-June.	The species grows well in charcoal filled pots or on wooden blocks and is under cultivation in the National Orchidarium, Botanical Survey of India, Shillong.	1. King, G. & Pantling, R. (1898). *J. Asia. Soc. Bengal* 66:590. 2. Pfitzer, E. & Kranzling, F. (1907). *In:* Engler, A. (ed.) *Pflanzenr.* 32:150.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

73	*Meconopsis latifolia* (Prain) Prain	A rock loving plant, seeding in the spaces between the rocks (4). It grows in the crevices of rocks or among loose piles of stone debris, on stone slides and below cliffs in the altitudes of 2200 to 4600 m. It prefers sunny areas near water springs for full growth after the snow melts off, while the ground is still damp (5).	None for the wild habitats	A detailed search should be made in the adjoining areas to see if it occurs elsewhere and to recommend suitable protection measures. It should be cultivated and re-established in its natural habitats.	A very striking member of the genus *M econopsis.,* and widely admired in horticulture for its attractive flowers. Flowers appear in July to August and fruits in September to October. It is of scientific interest because of its very restricted distribution. Taxonomically it is very close to *Meconopsis aculeata* Royle of the Western Himalaya and *M. sinuata* Prain of the Eastern Himalaya.	Originally described from a plant cultivated at Kew raised from seeds sent by Lt. Col. Appleton in 1906. Horticulturists regard this species as one of finest in cultivation and it is certainly a plant of high merit which has not become as common in gardens as one would have expected (6).	1. Chittenden, Fred J. (1956). *Dictionary of Gardening* 3: 1270-1272. Clarendon Press, Oxford. 2. Debnath, H. S. & Nayar, M. P. (1984). *Fasc. Fl. India* 17: 20-21. Botanical Survey of India, Howrah. 3. Debnath, H. S. & Nayar, M. P. (1986). *The Poppies of Indian Region.* Botanical Survey of India, Calcutta. p. 67. t. 23. 4. Evans, A. (1959). *Meconopsis* species and hybrids. *J. Roy. Hort. Soc.* 84: 505. 5. Prain, D. (1915). Some additional species of *Meconopsis. Bull. Misc. In! Kew* 1915, p. 146-147. 6. Taylor, G. (1934). *An Account of the genus Meconopsis.* New Flora and Silva, London. p. 97 & 125.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
74	*Psychotria aborensis* Dunn	In deep shaded gorges and stream sides at 300-1220 m in alt.	None.	Serious efforts should be made to locate the plant and cultivate in botanic gardens.	As the original gathering was without flowers, the plant is not fully known. It is of academic interest.	Not cultivated anywhere.	1. Burkill, I. H. (1925). *Rec. Bot. Surv. India* 10: 361. 2. Dunn, S. T. (1920). *Kew Bull.* 1920: 133.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
75	*Lastreopsis wattii* (Bedd.) Tagawa	Grows at about 1800 m altitude. No other information is available due to non-collection of this species.	None.	Intensive search in its type locality and other likely areas and *ex situ* conservation in conservatories if rediscovered, should be tried.	No information		1. Beddome, R. H. (1888). New Manipur Ferns collected by Dr. Watt. I. *Bot.* 234. 2. Beddome, R. H. (1892). *A Handbook to the ferns of British India, Ceylon and the Malay Peninsula with supplement,* p. 49. 3. Tagawa, M. (1949). Fern. Miscellany (1). I. *lap. Bot.* 22: 163.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry
76	*Alhyrium atratum* Bedd.	No information available due to further non collection of this species. No precise data on the ecology has been indicated by the original collector.	None.	Attempts should be made to locate this species in Mani-pur and adjoining regions and if rediscovered, it is to be introduced into Botanic Gardens and Conservatories.	No information; however an endangered species with restricted distribution.		1. Beddome, R. H. (1892). *A Handbook to the ferns of British India, Ceylon and the Malay Peninsula with supplement,* p. 33.	Red Data Book of Indian Plants Vol. 1, 1987. M.P. Nayar & A.R.K. Sastry

77	*Angelica nubigena* (Clarke) Mukh, (Heracleum nubigenum Clarke)	No details known but apparently it might be. growing in open situations along, steam courses like the other Angelicas	None so far.	Attempts to rediscover the species should be made for planning conservarion measures.	Not screened as yet, but reports about other Angelicas reveal of high economic importance like their uses in flavouring sweetmeats and beverages, The indigenous use of roots as a cardiac-stimulant by the hillmen is also reported (I).		1.Krishna, S. & Badhwar, R. L. (1952). Aromatic plants of India, Part XV. J. Sci. Indust. Res. 11 (12): 254-261.	Red Data Book of Indian Plants Vol.2,1990. M.P. Nayar & A.R.K. Sastry.
78	*Pimpinella flaccida* Clarke	Not known	Not known	An intensive and extensive search for relocating the populations of this species, followed by *ex situ* conservation and study of biology are needed to determine the status of the species and to attempt to conserve the species.	Not known; of botanical interest		1. Clarke, C. B. (1889). On the plants of Kohima and Munneypoore. J. *Linn. Soc. Bot.* 25 :28.t.15.	
79	*Pternopetalum senil* Deb et Dutta	Not reported	None	Exploration for collection of wild populations; study of biology; prospects of *ex situ* or *in situ* conservation to be studied.	Not known; of botanical interest		1. Deb, D.B. & Dutta, R.M. (1969). An addition to Umbelliferae from north-east India. *J. Sen Memorial Vol.* p. 421, f.1. Botanical Society of Bengal, Calcutta.	
80	*Trachycarpus takil* Becc.	Groves on mountain slopes at 2000-2500 m, where it sustains frost and snow. It prefers cool narrow valleys in the north-west Himalayas. It was frequent at. the height of 2500 m in the mixed forests of *Quercus* (2).	None at present	Collection of seeds from natural population and introduction into botanical gardens and demarcation of some of its habitats as protected areas, are suggested. .	A palm species of great botanical interest. One of the few palm species that thrives in frost and snow. The present taxonomic status demands further knowledge on this taxon; therefore collection of materials from the wild for *ex situ* conservation and study is necessary. Its local uses are unknown.	Reported to be cultivated in the Chaubattia garden in Uttar Pradesh.	1. Beccari, O. (1933). Asiatic Palms. Coryphae. *Ann. Roy. Bot. Gard. Calcutta.* 13: 281.2. Duthie, J. F. (1886). *Gard. Chron.* p. 457.	
81	*Ceropegia angustifolia* Wight	Reported to be growing in open grasslands in the altitudes of 1500 to 2000 m.	None.	Attempts should be made to recollect the species and it should be conserved in well-protected areas; uprooting of plants be prohibited.	A distinct twiner, reported flowering during July-September.		1.Ansari, M. Y. (1984). Asclepiadaceae:Genus-Ceropegia. Fasc. Fl. India 16: 8. f. 2 (5); f. 1. Botanical Survey of India, Howrah. 2.Hooker, J. D. (1883). Fl Brit. India 4: 72. 3. Kanjilal, U. N., et al. (1939). Fl. Assam.3: 308.	

82	*Ceropegia arnottiana* Wight	Not known.	None on record.	Efforts should be made to relocate the species and should be conserved in situ or be grown in protected areas under similar ecological conditions; uprooting of the plants be prohibited; propagation through seeds be tried to multiply its populations and for reintroduction in its natural habitats.	Not known; flowers during September.		1. Ansari. M. Y. (1984). Asclepiadaceae: Genus-Ceropegia. Fasc. Fl. India. 16: 9. Botanical Survey of India, Howrah. 2. Hooker, J. D. (1883). Fl. Brit. India 4: 74.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
83	*Ceropegia hookeri* Clarke. ex Hook. f.	Not known; however, it grows in areas ranging between 3000-4000 m altitude in the Himalayas, probably in alpine grassy meadows.	None.	Uprooting of the plants be strictly prohibited, whenever and wherever located; should be conserved in protected areas under similar ecological conditions; propagation and multiplication of the plants be tried.	It is known to flower during June-July.		1. Ansari, M. Y. (1984). Asclepiadaceae: *Genus-Ceropegia. Fasc. Fl. India* 16 : 17. t. 8. Botanical Survey of India, Howrah. 2. Hooker, J. D. (1883). *Fl. Brit. India* 4 : 73.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
84	*Ceropegia lucida* Wall.	Not known.	None on record.	Intensive search must be made; uprooting of plants be prohibited; should be conserved in protected areas, if located; propagation through seeds be tried in botanic gardens.	A twiner with beautiful flowers blooming during September to November.	Not known.	1.Ansari, M. Y. (1984). Asclepiadaceae: Genus-Ceropegia. Fasc. Fl. India 16 :22. Botanical Survey of India, Howrah. 2.Hooker, J. D. (1883). Fl. Brit. India 4 :73. 3.Kanjilal, U. N., et al (1939). Fl. Assam 3: 309. 4.Wallich, N. (1831). Pl. Asiat. Rar. 2: 33. t. 139.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
85	*Inula racemosa* Hook. f.	In natural habitats this species grows in open temperate grassy hill slopes in altitudes of 3000-3500 m.	None for the wild populations or its habitats. The species is cultivated in the Lahul valley of Himachal Pradesh.	(i) Baseline data on the distribution and .ecological status, population density, competition between associates, etc. are to be collected. (ii) Production of seed and percentage of seed germination should be studied. (iii) Rehabilitation in the depleting habitat or ecologically akin to natural habitat is necessary. (iv) Steps should be /taken to check the possible removal from the natural populations. .	Manukut' is the vernacular name of this plant and is used as a substitute of 'Kuth' plant (Saussurea costus). The cost/per bag of 40 kg roots varies from Rs. 600 to Rs. 800 and is a valuable foreign exchange earner. Fresh roots are aromatic and in Kashmir it is known as 'Poshkar'. The roots yield inulin and an essential oil containing alantolactone (Wealth of India 5 :236. 1959).		1.Clarke, C. B. (1876). Camp. India, p. 118. 2. Hooker, J. D. (1881). Fl. Brit. India 3 :292.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.

86	*Saussurea bracteata* Decne.	In rock-crevices with species of Cacex, Primula, Pedicularis, etc. in alpine region in the altitudinal range of 3500-5500 m.	None for the natural populations.	Habitats should be protected for in situ. preservation of the populations.	Flowers during July-September, and it is of botanical interest.	Not known.	1.Jain, S. K. & Sastry, A. R. K. (1980). Threatened Plants of India--A State-of-the-Art Report. Botanical Survey of India. p.37. 2.Polunin, A. & Stainton, O. (1984). Flowers of Himalayas, p. 207. 3.Naithani, B. D. (1984). Fl. Chamoli District 1 :340.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
87	*Saussurea costus* (Falc.) Lipschitz	In sub-alpine Himalayas, on open hill-slopes, in the attitudes of 3200-3800 m.	None for the wild populations or its habitats, !1owever; the species is now included in the Appendix-I of the CITES. It is being cultivated on a small scale in the Himalayas.	Baseline data on the distribution and ecological status, population density, etc.; rehabilitation in its depleting habitats or ecologically akin to natural habitats in its distribution range; protection of natural habitats.	Kuth' is cultivated for its roots used in perfume industry. The dry root is commercially known as 'costus' root which is strongly scented and yields an aromatic oil. It is also used to make insecticides. The root contains an alkaloid known as Saussurine which has medicinal properties and is good for stomach ailments. It is an antiseptic and is also used in chronic skin-diseases, asthma, high blood pressure, etc.	The species is cultivated in Lahul valley of Himachal Pradesh and occasionally in Garhwal region of Uttar Pradesh.	1. Anonymous (1972). *Wealth of India* 9 :240-243. New Delhi. 2. Blatter, E. (1927). *Beautiful Flowers of Kashmir* 1 :185, t. 33, fig. 1. London. 3. Coventry, B. D. (1923). *Wild Flowers of Kashmir* 1 :51. t. 26. London. 4. Dhar, U. &. Kachroo, P. (1983). *Alp. Fl. Kashmir Himal.* 223. Jodhpur. 5. Lipschitz, S. (1979). *Rod. Saussurea,* Leningrad.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
88	*Rhopalocnemis phalloides* Jungh.	It grows in diffused sunlight in dense evergreen virgin forest floors either solitarily or in clusters on roots of the members of Vitaceae. It is a perennial herb, blooms in winter.	None on record. However, its distributional localities in Arunachal Pradesh fall within the proposed Namdapha Biosphere Reserve.	Protected being a part of the proposed Namdapha Biosphere Reserve in Tirap district of Arunachal Pradesh.	A very striking large, fleshy root parasite of the family Balanophoraceae of botanical interest. The only species of this genus growing in North-eastern India in the specific ecological niches. Flowers in December.	Being a root parasite, it would be rather difficult to grow this species *ex situ.*	1. Hooker, J. D. (1886). *Fl. Brit. India* 5:239. 2. Joseph, J. & Chauhan, A. S. (1983). *In:* Jain, S. K. & Sastry, A. R. K. (ed.). *Botany of some tiger habitats in India.* Botanical Survey of India, Howrah. p. 26-29. 3. Jungh. (1814). *Nov. Act. Acad. Nat. Cur.* 18(1) : 233. 4; Kanjilal, U.N., *et al* (1949). *FI, Assam* 4:133.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
89	*Berberis apiculata* (Ahrendt) Ahrendt	In open dry places on hill slopes.	None so far.. not even listed in the threatened plants catalogues so far published.	As there is no record of this species from other localities, field surveys should be undertaken to locate this species in its type locality and other parts in Himachal Pradesh. The area should. be declared as protected for in situ conservation of this species. As the hill ecosystems are fragile, ex situ conservation should also be undertaken by introducing this species into experimental gardens.	The species like other species of Berberis may be of some medicinal value.	Not cultivated; but immediate efforts should be made to study the ecological requirements of the species,	1. Ahrendt, L. W. A. (1961). *Berberis and Mahonia-A* Taxonomic Revision. *J. Linn. Soc. London* 57: 1-410.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.

90	*Erysimum thomsonii* Hook.f.	Not known.	None on record.	The species should be thoroughly searched in its type locality and adjascent areas for more detailed study, so that suitable conservation measures can be suggested.	Nothing is known about this extremely rare species; further collections may only throw light on these aspects.		1. Jafri, S. M. H., (1973). *In* : Nasir & Ali, A., *Fasc. Fl. West Pakistan* 55 :239. f. 32. 2. Hooker. J. D. (1861). *J. Linn. Soc. Bot.* 5 :165. 3. Hooker, J. D. & Anderson, T. (1872). *In* : Hook. f., *Fl. Brit. India* 1 :154.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
91	*Campanula wattiana* Nayar *u* Babu	On rocks above nullah tracts etc. at elevations between 22003900 metres.	None	(i) Further explorations of wild populations to identify threats, if any. (ii) Evaluation of prospects for ex situ or in situ conservation.	Potential for horticulture as an ornamental plant.	No record available.	1. Chowdhury, H., J. & Wadhwa, B. M. (1984) *Fl. Himachal Pradesh* 2 : 429-434. Botanical Survey of India, Calcutta. 2. Nair, N. C. (1977). *Fl. Bashahr Himalayas,* p. 170. 3. Nayar, M. P. & Babu, C. R. (1970). *Campanula wattiana* Nayar & Babu {Campanu-laceae)-A new species from N. W. Himalaya. *Jour. Ind. Bot. Soc.* 49 : 183-185.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
92	*Codonopsis affinis* Hook. f. *et* Thoms.	In temperate Himalaya at elevations between 1830-3335 m.	None	(i) To locate the plants in further wild states. (ii) To remove threats to the habitats, if any. (iii) To conserve *in situ* and ex *situ.*	Not fully explored; of botanical interest in having the smallest flowers in Indian species of *Codonopsis.*	No report	1. Hara, H. (1966). *FI Eastern Himalaya. Report* 1. University of Tokyo. p. 326. 2. Hooker, J. D. & Thomson, T. (1858). *J. Linn. Soc. Bot.* 2 : 4-29.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
93	*Cyananthus integra* Wall. ex Benth.	On moist rocks in temperate .and a1pine tones amidst Rhododendron species, etc. at elevations between 2800,4{)00 m.	Proposed biosphere reserve in Nanda Devi would help *in situ* preservation of the species.	(i) Explorations to locate further wild populations, study of biology and ecology and (ii) conservation trials at locations of its occurrence or in nearby biosphere reserves. .	Of horticultural importance for its flowers	Cultivated In English rock gardens at Corrour and Wisely (1); no report available for India	1. Cowan, J. M. (1938). Concerning the genus *Cyananthus. New Flora et Silva.* 10: 108-115, 181-190. 2. Royle, J. F. (1836). *Illus. Bot. Himal.* 1: 309 t. 69.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.

94	*Capparis cinerea* Jacobs	On open hill sides, at 1800 m.	Nil.	Our knowledge of the species is limited to the solitary collection by F. Kingdon Ward from Khaiyang in Manipur. Efforts should be made to recollect this rare but distinct species, closely allied to C. *cataphyllosa* Jacobs, a Burmese species. This region is one of the centres of origin of *Capparis* in the Cataphyllosa-group and intensive explorations are likely to result in rediscovery of C. *cata phyllosa,* C. *cinerea* and C. *pachyphylla* besides other new taxa of this genus.	Nothing is known		1. Jacobs, M. (1965). The genus *Capparis* (Capparaceae) from the Indus to the Pacific. *Blumea* 12: 444-445.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
95	*Silene kumaonensis* Williams	Amidst rocks in valleys in the altitude range of 2500-4000 m, growing along with *Arenaria ferruginea* Duthie ex Williams and other herbaceous species.	None so far	Explorations are necessary to search out the plant in the original habitat to assess the population and to find out causes of threat.	Not known	Not cultivated	1. Williams (1896). *J. Linn. Soc. Bot.* 32: 43. 2. Strachey, (1918). *Cat. PI. Kumaon,* p. 18. 3. Naithani, B. D. (1984). *Fl. Chamoli* 1 : 84. 4. Bocquet & Chater, (1979). *In* : Hara & Williams, *Enum. Fl. PI. Nepal* 2: 56.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
96	*Silene kunawarensis* Royle	Grows on rocks in the valleys at 2300-3300 m, in the Western Himalayas.	None so far	Intensive exploration for relocating the plant in, original habitats and proper *in situ* and *ex situ* measures are to be taken.	Not known.	Not cultivated	1. Chowdhery, H. J. &Wadhwa, B. M. (1984) *Fl. HimachalPradesh* 1: 97. 2. Hooker, J. D. (1874). *Fl. Brit. India* 1: 220. 3. Nair, N. C. (1977). *Fl. Bashahr Himalaya,* p. 39. 4. Rau, M. A. (1975). *High Alt. Fl. Plants,* p. 79. 5. Rohrbach (1868). *Monogr. Silene,* p. 211. 6. Stewart, I. D. (1972). *Cat. PI. W. Pak.* & *Kashmir,* p. 251.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
97	*Aneilema glanduliferum* Joseph *et* Rolla Rao	This species grows along wet rocky slopes near river banks.	None on record.	*In situ* conservation by protecting its natural habitat; introduction to other ecologically suitable adjoining areas of, Eastern India; *ex situ* conservation in botanical gardens.	This species seems to be endemic 10 eastern Himalayan foot hills. It is of great phytogeographical, botanical and evolutionary interest. Very little information is available about its morphology and cytology. Flowers during August- September.	Not known.	1.Joseph, J. & Rolla S. Rao (1968). *Aneilema glanduliferum* Joseph *et* Rolla Rao- A new species from NEFA. *J. Indian Bot. Soc.* 47: 367-371. 2.Kammathy, R. V.(1983). Rare and Endemic species of Indian Commelinaceae. *In:* Jain, S. K. & Rao, R. R. (ed.). *An Assessment of Threatened Plants of India.* Botanical Survey of India, Howrah. p. 213-221.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.

98	*Carex kingiana* Clarke		None so far.	Intensive search in the type locality should he made to relocate this species and in situ conservation by protecting the habitat is proposed.	The species is of botanical value. Cultivation: So far not known.		1. Clarke, C. B, (1908). New genera and species of Cyperaceae. *Kew Bull. (Add. Ser.)* 8: 1-196	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
99	*Dioscorea deltoidea* Wall. ex Kunth	Tropical-Temperate Himalaya, 1000-3500 m alt:	Cultivation is attempted.	Conservation of natural habitat of the plant; its cultivation in Botanic gardens. Attempts should also be made to grow this plant under controlled conditions keeping its slow growth in view	It grows usually in the sub-tropical conditions in wild but too slow growing. Fls. and. Frts.: May-July. Tubers are not edible but are rich in saponin and are used for washing silk, wool and hair and in dyeing.	The species is very slow growing due to which all the attempts made so far for its commercial cultivation have not been successful.	1. Anon. (1952). *The Wealth of India-Raw materials* 3:72. 2. Atal, C.K. & Kapur, B.M. (ed.) (1982). *Cultivation and utilization of medicinal plants*. 3. Prain, D. & Burkill, I.H. (1936). *Ann. Roy. Bot. Gard. Calcutta* 14:25. t: 4. .	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
100	*Crotalaria meeboldii* Dunn	In hills upto 900 m.	Nil.	To search for the species in its type locality and to study it thoroughly; to collect live plants and seeds for ex situ propagation.	Of botanical interest due to its restricted and localised occurrence.	Not known.	1. Dunn, S. T. (1912). *Bull. Misc. Inform. Kew* 7: 340.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
101	*Crotalaria noveoides* Griff.	In open grasslands along hill slopes.	None on record.	To search for the species in its original habitat. If located, the area should be protected and its populations should be studied for ex situ conservation through seeds and plants in botanic gardens and reintroduction into similar habitats in Khasia Hills, Meghalaya.	Of botanical interest, due to restricted distribution	Not known.	1. Griffith, W. (1948). *Itin. Notes* (Posth. paper II) 26. No. 396.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
102	*Lioydia himalensis* Royle	On cliffs or on rocks and gravels, amongst moss or grass at 3695-3810 m altitude.	None	Intensive search for the wild populations; introduction of its bulbs in the experimental gardens of the Botanical Survey of India at Pauri and Shillong for multiplication.	Confined to Himalayas. Its related species *L. serafina* has a wide distribution. Species of *Llaydia* are ornamental plants in temperate gardens.	Not known.	1. Royle, J. F. (1839-40). *Illustr. Bot. Himal.,* p. 387-388. t. 93.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.

103	*Nomocharis synaptica* Sealy	On rocky alpine meadows or on slopes of ridges at 3048-3695 m altitude, on loamy and granite chips exposed to sunlight, in association with the plants like *Rodgersia, Roscoea, Iris* and *Paphiopedilum.*	None on record.	Collection of live plants and conservation in experimental gardens of the Botanical Survey of India at Shillong and Pauri.	Like the species of *Lilium* this can be popularised as an ornamental plant. This species together with 4 other species of the section *Lophophora* is distinct from typical *Nomocharis* in its filaments which are like those of *Lilium.*	Not known.	1. Sealy, J. R. (1950). *Nomocharis* and *Lilium. Kew Bull.* 5: 296. 2. Dasgupta, Syamali & Deb, D.B. (1983). Taxonomic revision of the genus *Nomocharis* (Liliaceee) in India and adjoining region. *J. Econ. Tax. Bot.* 4 : 553.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
104	*Aspidopterys oxyphylla* (Wall.) Juss.	A slender twining shrub growing in tropical evergreen forest *(ca* 1000 m). Flowers during September and fruits are possibly set by December	None on record.	A thorough exploration in its known habitat should be made and if relocated its further collection should be stopped to protect *in situ*	Nothing is known so .far about its biology and potential value.	Not in cultivation.	1. Blatter, E. (1930). A proposed revision of the Flora of British India. *J. Indian Bot. Soc.* 140-150. 2. Hooker, J. D. (1874), Malpighiaceae. *Fl. Brit. India* 1: 420. 3. Kanjilal, U. N., Kanjilal. P. C. & Purkayastha, C. (1936). *Fl. Assam* 2: 187. 4. Srivastava, R. C. (1985). Notes on threatened taxa of Malpighiaceae of India.*J. Econ. Tax. Bot.* 6(1): 64.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
105	Mitrastemon yamamotoi (Makino) Makino	A root parasite on *Castenopsis* species and other members of the family Fagaceae and grows in thick moist virgin forests. It grows so closely with the host that its seems to be a part of host plant. Its growing period is from December to February and needs low light intensity	None. However, the Mowsmai forest in Meghalaya has been declared as a 'reserved forest' recently	To declare the locality as protected area so it may propagate naturally in due course of time. Efforts are also being made to locate this species in other adjoining areas in wild.	A very striking member of genus *Mitrastemon,* having scale-like thick brown leaves with small flowers, appearing in the wild during November to March.	Being a root parasite no steps would be possible for its cultivation	1.Ohwi Jisaburo (1965): *Fl. Japan,* p. 402. 2.Rao, A. S. (1974): Vegetation and Phytogeography of Assam-Burma. *In:* M. S. Mani (ed.). *Ecology and Biogeography in India.* pp. 204-246.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.

106	*Bulleyia yunnanensis* Schltr.	It grows as an epiphyte on trees. It occurs usually at an altitude of *ca* 2000 m.	None for the wild plants or its habitats. Orchids are included in Appendix 2 of the 1973 Convention on International Trade in Endangered Species of Fauna & Flora, which bans export of orchids.	To bring live plants into cultivation from wild for multiplication by tissue culture/seed culture etc. Though it has a wider distribution, only it is found in a few localities with limited populations in India.	Ornamental. The many biseriately arranged flowers in long drooping racemes appear in June-July and last for about 2 weeks.	Only two plants introduced from Subansiri district in 1965, are under cultivation in the National Orchidarium, Botanical Survey of India, Shillong. It can easily be brought under cultivation (3)	1.Jain, S. K. & Sastry, A. R. K. (1980). *Threatened Plants of India-A State-of-the-Art- Report.* Botanical Survey of India, Howrah. 2.Kataki, S. K., Jain, S. K. & Sastry, A. R. K. (1984). *Threatened and Endemic orchids of Sikkim and North-eastern India.* Posscef., Botanical Survey of India, Howrah. p. 11, t. 6. 3. Sastry, A. R. K. & Kataki, S. K. (1965). Notes on the distribution of *Bulleyia yunnanensis* Schltr. *Ind. For.* 91 (12): 862.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
107	*Aphyllorchis parviflor* a King & Pantl.	Grows on humus rich black soils under the forest canopy of *Quercus.*	None so far. The export of all species of Orchidaceae is regulated under the CITES convention	Habitat should be preserved.	Flowers during June-July. It is of botanical interest as it is a rare saprophytic orchid.	Not known.	1. Bose, T. K. &, Bhattacharjee, S. K. (1980). *Orchids of India,* p.71. Calcutta. 2. Hara, H. *et al*. (1978). *Enumer. Flower. Pl. Nepal* 1: 31. 3. King, G. & Pantling, R. (1896). *Journ. As*. *Soc. Beng.* 65(2): 128. 4. King, G. & Pantling, R. (1898). The Orchids of Sikkim Himalaya. *Ann. Roy. Bot. Gard. Calcutta* 8: 262. t. 348. Calcutta. 5. Pradhan, U. C. (1976). *Indian Orchids: Guide to Identification* and *Culture* 1 : 139. Calcutta.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.

108	*Bulleyia yunnanensis* Schltr.	It grows as an epiphyte on trees. It occurs usually at an altitude of *ca* 2000 m.	None for the wild plants or its habitats. Orchids are included in Appendix 2 of the 1973 Convention on International Trade in Endangered Species of Fauna & Flora, which bans export of orchids.	To bring live plants into cultivation from wild for multiplication by tissue culture/seed culture etc. Though it has a wider distribution, only it is found in a few localities with limited populations in India.	Ornamental. The many biseriately arranged flowers in long drooping racemes appear in June-July and last for about 2 weeks.	Only two plants introduced from Subansiri district in 1965, are under cultivation in the National Orchidarium, Botanical Survey of India, Shillong. It can easily be brought under cultivation (3)	1.Jain, S. K. & Sastry, A. R. K. (1980). *Threatened Plants of India-A State-of-the-Art- Report.* Botanical Survey of India, Howrah. 2.Kataki, S. K., Jain, S. K. & Sastry, A. R. K. (1984). *Threatened and Endemic orchids of Sikkim and North-eastern India.* Posscef., Botanical Survey of India, Howrah. p. 11, t. 6. 3. Sastry, A. R. K. & Kataki, S. K. (1965). Notes on the distribution of *Bulleyia yunnanensis* Schltr. *Ind. For.* 91 (12): 862.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
109	*Calanthe alpina* Hook. f. ex Lindl	Temperate to subalpine region, at an alt. of 2000-3300 m in the forests, near streams and in shady places.	None so far except that the export of all species of Orchidaceae is regulated under the CITES Convention	An effort should be made to determine the exact extent to which this species occurs; habitat should be preserved as a part of *in-situ* conservation measures; further collection of the wild plants should be discouraged and attempts for multiplication by tissue culture and reintroduction in its natural habitat be made	Flowers during July-Aug.; ornamental. Perigone white, tipped with green, lip white, striped with dull red; spur pale yellowish	The species has been in cultivation in some orchid nurseries in Eastern India	1.Hooker, J. D. (1880). *Fl. Brit. India* 5: 850. 2.King, G. & Pantling, R. (1898). Orchids of the Sikkim Himalaya. *Ann. Roy. Bot. Gard. Calcutta* 8: 170 t. 229, Calcutta. 3.Pradhan, U. C. (1979). *Indian Orchids: Guide to Identification and Culture* 2: 257. Faridabad. 4.Rathore, S. R. (1983). Endemic and rare species of *Calanthe* R. Br. (Orchidaceae). *In* : Jain, S. K. & Rao, R. R. (eds.). *An Assessment of Threatened Plants of India.* Botanical.Survey of India, Howrah. p. 238-239. 5.Seidenfaden, Gunnar & Arora, C. M. (1982). An enumeration of the orchids of North-Western Himalaya. *Nord. Journ. Bot.* 2 : 11.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
110	*Calanthe anthropophora* Ridley	It grows on limestone cliffs in open areas.	None for the wild population or its habitat. All the species of Orchidaceae are included in the Apperdix 2 of CITES Convention.	Intensive search has to be made to locate more plants of this species in wild and then to bring them under cultivation. Rapid propagation is only possible through tissue culture.	It is a good ornamental orchid with attractive white flowers, which appear during July.	This species does well in cultivation in a mixture of leaf mould, sand and powdered charcoal in the proportion of 8:1:1. Only one plant is under cultivation.	1. Seidenfaden, G. (1975). *Dansk Bot. Ark.* 29 (2): 19. 2. Goswami, N. & Joseph, J. (1985). *Ind. For.* 111 (4): 179-181, PI. 1 & 2.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.

111	*Calantha mannii* Hook. f.	In moist shady places in the forests, among rock boulders and along the mountain streams, in sub-tropical to temperate areas in *Quercus* forests	None so far, except that the export of all species of Orchidaceae is regulated under the CITES Convention.	Intensive exploration to find out some more populations in other localities; its collection from the disturbed habitats for reintroduction in undis.turbed similar habitats in its distribution range and introduction into orchidaria are suggested.	The species is of horticultural interest.	Reportedly grown in some private nurseries.	1. King, G.& Pantling, R. (1898). Orchids of the Sikkim Himayala. *Ann. Roy. Bot. Gard. Calcutta* 8 : 167 t. 225. Calcutta. 2. Duthie, J. F. (1906). Orchids of the North-West Himalaya. *Ann. Roy. Bot. Gard.Calcutta* 9 (2) : 120. Calcutta. 3. Kataki, S. K., Jain S. K. & Sastry, A. R. K. (1984). *Threatened and Endemic Orchids of Sikkim and North-eastern India.* Posscef, Botanical Survey of India, Howrah. p.15t.9. 4. Pradhan, U.C. (1979). *Indian Orchids: Guide to Identification and Culture* 2 : 256. Faridabad. 5. Seidenfaden,. Gunnar & Arora, C. M. (1982). An enumeration of the Orchids of North-western Himalaya. *Nord. 'Journ. Bot.* 2: 11.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
112	*Calanthe pachystalix* R.eichb. f. ex Hook. f.	In shady forest floors at about 2,000 m altitude.	None so far. However its export is regulated due to inclusion of the family Orchidaceae in Appendix 2 of the CITES Convention	Monitoring to search the known localities and other likely areas as this species has not been collected in the recent past; if rediscovered its habitats should be protected and plants be introduced into the National Orchidaria of the Botanical Survey of India.	Its greenish yellow, attractive flowers in dense racemes, makes it of horticultural value; flowers in July.	Not known.	1. Duthie, J. (1906). Orchids of the North-West Himalaya. *Ann. Roy. Bot. Gard. Calcutta* 9(?): 121. t. 104. Calcutta. Hajra, P. K. (1983). Rare, threatened and endemic plants of Western Himalayas-Monocotyledons. *Plant Conserv. Bull.* 4:1-13. Posscef, Botanical Survey of India, Howrah. Hooker, J. D. (1890). *Fl. Brit. India* 5: 850. Pradhan, U. C. (1979). *Indian Orchids: Guide to Identifcation and Culture* 2: 260. Faridabad Rathore, S. R. (1983). Endemic and Rare species of *Calanthe* R. Br. (Orchidaceae). *In:* Jain, S. K. & Rao, R. R. (Eds.) *An Assessment of threatened Plants of India.* Botanical Survey of India. Howrah. p. 238-239.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
113	*Coelogyne rossiana* Reichb. f.	Epiphytic on tall tree trunks of *Shorea robusta* and *Schima* sp. in mixed sal forests, at low altitudes.	None. It is included in Appendix 2 of the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora.	A rare species in wild; an attempt should be made to locate in other areas. Rapid multiplication is only possible through tissue .culture.	Botanical and horticultural importance; flowers during October-November.	It can be grown in well-drained charcoal filled pots or in baskets or directly on tree trunks.	1. Reichenbach, H. G. (1884): *Gard. Chron.* 2 : 808. 2. Hooker, J. D. (1890). *Fl. Brit. India* 5 : 843, 6 : 192. 3. Veitch, (1890). *Man. arch. PI.* 1: 48. 4. Pfitzer, E. & Kranzlin, F. (1907). *In* : Engler, *Oils Pflanienreich* 32 : 48. 5. Das, S. & Jain, S. K. (1976). *Ind. For.* 102 : 472. 6. Das, S. & Jain, S. K. (1980). *Fasc. Fl. India* 5: 26. Botanical Survey of India, Howrah.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.

114	*Corybas purpureus* Joseph etYog.	It grows in moist areas amidst dense mosses either on ground or on tree trunks near water sources, ensured with water spray	The family Orchidaceae is in Appendix 2 of the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora	The IUCN Plant Red Data Book has included one species of *Corybas* Le. C. *fornicatus* from Indonesia. The two species of *Corybas* viz. C. *himalaicus* from Sikkim and C. *purpureus* from Meghalaya are not reported elsewhere except from their type localities. Now, an urgent effort should be made to locate them in other places too for protection in wild or to introduce them into orchidaria.	A botanical curiosity. Flowers during July. The species is very much allied to *C. himalaicus.*	A very delicate plant. It is difficult to maintain it in cultivation. Hence, the best way of conservation is to preserve its natural habitat.	1. Joseph, J. & Yoganarasimhan, S. N. (1967). *Corybas purpureus-a* new species of orchid from. United Khasi & Jafntia Hills, Assam. *Ind. For.* 93 (12): 815-817. 2. Kataki, S. K., Jain, S. K. & Sastry, A. R. K. (1984). *Threatened and Endemic Orchids of Sikkim and North-Eastern India.* Posscef, Botanical Survey of India, Howrah. p. 22, t. 15.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
115	*Cypripedium cordigerum* D. Don	In open rocky places amidst other herbs and under *Quercus--Rhododendron-Viburnum* forests.	None so far. Export is regulated as the family Orchi-daceae is included in Appendix 2 of CITES.	Cultivation in National Orchidaria; multiplication by tissue culture method and reintroduction in its natural habitats	A spectacular ground orchid of horticultural value. Flowers during May-June.	Reportedly grown in some private nurseries in India and abroad.	1. Hajra, P. K. (1983); Rare, Threatened and Endemic plants of the Western Himalayas. *In:* Jain, S. K. & Sastry, A. R. K. (ed.) *PI. Cons. Bull.* 4: 3. Posscef, Botanical Survey of India, Howrah. 2. Jain, S. K. & Sastry, A. *R.* K. (1980). *Threatened Plants of India-A State-of-the-Art Report,* p. 19. New Delhi. 3. Pradhan, U. C. (1976). *Indian Orchids.. Guide to Indentification and Culture* 1: 35. Faridabad. 4. Rao, A. S. (1979). *Orchids of India,* p. 33. New Delhi. 5. Seidenfaden, G. & Arora, C. M. (1983). An enumeration of Orchids of Northwestern Himalaya. *Nord. Journ. Bot.* 2: 12.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
116	*Puccinellia kashmiriana* Bor	Alpine region at 3500-5000 m. Reported to grow gregariously forming purplish patches.	None.	The species should be thoroughly searched in the type locality and adjacent areas for its recollection so that a more elaborate study can be made which will help in suggesting suitable conservation measures for this extremely rare grass.	Nothing is known	Not known in cultivation.	1. Bor, N. L. (1953). *Kew Bull.* 1953: 270. 1953. 2. Bor, N. L. (1960). *The Grasses of Burma, Ceylon, India and Pakistan,* p. 562. 3. Cope, T. A. (1982). *In..* Nasir & Ali (ed.). *Fl. West Pakistan* 143 : 433.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
117	***Aconitum falconeri*** Stapf var. ***latilobum*** Stapf	Alpine regions of Himalaya.	None.	Further collection of this plant from the wild should be banned/stopped and attempts should be made to cultivate this deadly poisonous aconite for its proper exploitation.	Deadly poisonous of all the aconites, used in many medicines under the trade name "Bish" or "Atis".	Not known in cultivation	1. Basu, B. D. (1918). *Indian MediCinal Plants,* part 1. p. 11. 2. Stapf, C. (1904). *Aconites of India,* p. 164. pl. 105. fig. 13, 14.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.

118	***Delphinium uncinatum*** Hook. f. *et* Thoms	On the shady slopes of *Quercus-Rhododendron* forests (1500 m) and perhaps has a very short life span (April- May).	None.	Thorough explorations should be made to locate this plant for proposing suitable conservation measures.	Not known; ornamental.	Not known in cultivation.	1. Aswal, B. S. & Mehrotra B. N. (1983). *Delphinium uncinatum* Hook. f. & Thoms. (Ranunculaceae) and *Lilium wallichianum* Schultes. f. (Liliaceae)-Two rare finds from North-West Himalayas. *In:* Jain, S. K. & Rao, R. R. (ed.). *An Assessment of Threatened Plants of India.* Botanical Survey of India, Howrah. 2.Bruhl & King, G. (1896). *Ann. Roy. Bot. Gard. Calcutta* 5 : pl. 116. fig. 2, 3. 3.Hooker, J. D. & Thomson, T. (1872). *In:* Hooker, J. D., *Fl. Brit. India* 1 : 24. 1872 4.Munz, P. A. (1967). A synopsis of the Asian species of *Delphinium* sensu stricto. *Journ. Arnold Arb.* 48: 300.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
119	*Acranthera tomentose* R. Br. ex Hook.f.	In moist dense forests. Conservation Measures Taken: None	Cultivation in the gardens as an ornamental plant for its fairly large beautiful flowers.		Worthy of cultivation in the gardens as an ornamental plant	Not known to have been cultivated anywhere	1. Hooker, J. D. (1880). *Fl. Brit. India* 3 : 92.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
120	*Hedyotis scabra* Wall. ex Kurz		None.	*Ex-situ* conservation of the species in botanic gardens	A plant of academic interest, not yet studied thoroughly. Fls. & frs. : July-December.	Not taken up anywhere.	1. Hooker, J. D. (1886). Fl. Brit. India 3 : 62. 2. Kurz, S. (1977). Journ. Asiat. Soc. Bengal 46(2) : 136.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
121	*Ophiorrhiza gracilis* Kurz	On the forest floors in the high altitudes	None	Efforts should be made to collect the plant from the type localities and cultivate in botanic gardens.	A plant of academic interest, not known thoroughly	Not taken up anywhere	1. Clarke, C. B. (1889). *Journ. Linn. Soc. Bot.* 25 : 31. 2. Hooker, J. D. (1880). *Fl. Brit. India* 3 : 80. 3. Kurz, S. (1872). *Journ. Asiat. Soc. Bengal* 41 (4) : 311.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
122	*Ophiorrhiza griffithii* Hook. f.	In forest floors in rocky situations	Nil	Efforts should be made to collect the species from its original habitats in Nagaland and if available attempts should be made to protect that locality; introduction of the plants in botanic gardens.	A plant of academic interest, not known thoroughly. Flowers in March-April.	Not taken up.	1. Griffith, W. (1854). *Ic. Plant. Asiat.* 1 : 264. t. 475. 2. Hooker, J. D. (1880). *Fl. Brit. India* 3 :82. 3. Kanjilal, U. N., *et. al.* (1934). *Fl. Assam* 3 : 42.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
123	*Ophiorrhiza hispida* Hook. f.	Grows on damp, shady places near streams at 90-1800 m in dense forests.	Nil	Search for the plant in the places of earlier collection should be made, and if rediscovered, that locality should be protected and reserved, and it should also be cultivated in botanic gardens.	A plant of academic interest, not studied thoroughly	Not taken up anywhere.	1. Balakrishnan, N.P. (1981). *Fl. Jowai* 1: 249. Botanical Survey of India, Howrah. 2. Hooker, J.D. (1880). *Fl. Brit. India* 3: 83. 3. Kanjilal, U.N., *et el.* (1939). *Fl. Assam* 3: 42.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.

124	*Ophiorrhiza lurida* Hook.f.	Grows on damp shady mountain slopes at 300-1500 m in alt.	Nil.	Efforts to relocate the species in its distribution range in India for future conservation steps are suggested.	A plant of academic interest. Flowers and fruits during May-November.	Not taken up.	1. Deb, D.B. (1983). *Fl. Tripura State* 2 : 76. 2. Hooker, J.D. (1880). *Fl. Brit. India* 3 : 82.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
125	*Ophiorrhiza subcapitata* Wall. ex Hook. f.	On moist shady forest floors near streams at 900-1600 m in alt	Nil.	It should be cultivated in botanic gardens. Plant diversity areas in Khasi-Jaintea Hills should be identified and declared as protected reserves as the flora of this region is rich in endemics and threatened species	A plant of academic interest, and of restricted occurrence.		1. Balakrishnan, N. P. (1981). *FI.Jowai* 1: 148. Botanical Survey of India, Howrah. 2. Hooker, J. D. (1880). *Fl. Brit. India* 3 : 83. 3. Kanjilal, U. N., *et al.* (1939). *Fl. Assam* 3 : 42.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
126	*Ophiorrhiza tingens* Clarke ex Fischer	In crevices of rocks filled with moist soils along forest streams in the altitudes of 150-1800 m	None.	Cultivation in botanic gardens.	A plant of academic interest, not yet studied thoroughly. Flowers and fruits during April-September.	Not taken up anywhere.	1. Deb, D. B. (1983). *Fl. Tripura State* 2 : 76. 2. Fischer, C.E.C. (1940). *Kew Bull.* 1940 : 33.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
127	*Rubia edgeworthii* Hook. f.	Along the forest margins.	Nil.	To collect seeds and cultivate the plant in botanic gardens.	Allied species yield dye. A plant of academic interest. Flowers during September-October	Not taken up anywhere.	1. Deb, D. B. & Mallick, K. C. (1968). Bull. Bot..Surv.India 10 : 1-16. 2.Hooker, J. D. (1881). Fl. Brit. India 3: 203.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
128	*Rubia himalayensis* Klotzsch	In open situations and along forest margins in subtropical forests	Nil.	It should be cultivated in botanic gardens	A plant of academic interest. Some of the allied species yield dye. Flowers and fruits from June-September	Not known to be cultivated anywhere.	Deb, D. B. & Mallick, K. C. (1968). *Bull. Bot. Surv. India* 10 : 1-16. 2. Hooker, J. D. (1881). *Fl. Brit. India* 3 : 203. 3. Koie & Rechinger (1958). *Symb. Afgh.* 4 : 140	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
129	*Pauia belladonna* Deb *et* Dutta	At the outskirts of forest at about 2000 m in altitude,	None	Efforts should be made to collect seeds and cultivate the plant in botanic gardens.	Ripe fruit of the plant is not yet known. It contains some properties like those of belladonna. It is also of academic interest. Flowers during July-September.	Not taken up anywhere.	1. Deb, D. B. & Dutta, R. (1965). *Ind. For.* 91 (6): 363-366.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.

130	*Alniphyllum fortunei* (Hemsl.) Makino	The species grows in dense sub-tropical and temperate forests in the altitude of about 1600 m. The area receives an annual rainfall of about 3000 mm and experience heavy frost in winter months. Soils are loamy and rich in humus.	None.	Introduction of the species into suitable botanic gardens, and storage of seeds in seed-banks. Certain virgin forest areas in Subansiri district having rich plant diversity should be considered for preservation as protected forests.	The species flowers in profusion and looks attractive with its white flowers and green foliage for cultivation in botanic gardens. This is the only species of the genus known so far		1. Hemsely, W. B. (1889). *J. Linn. Soc.* 26 : 75. (as *Helesia ? fortunei*). *2.* Makino, T. (1906). *Bot. Mag. Tokyo* 20 : 93. 3Perkins, J. (1907). Styracaceae. *In:* Engler, A. (ed.). *DasPflanzenr.* 30 : 91. 4. Sastry, A. R. K. (1967). *Alniphyllum* Mats. and *Huodendron* Rehder-Two additional generic records to the Indian Styraceae. *Bull. Bot. Surv. India* 9 : 297-298. Fig. 1.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
131	*Huodendron biaristatum* (W. W. Sm.) Rehder	Grows in dense subtropical and temperate forests in the altitude of about 1700 m. The area receives about 3000 mm of rainfall annually, with heavy frost in winter months. Soils are loamy and rich in humus.	None	Introduction of the species into suitable botanic gardens; collection and preservation of seeds in seed banks and preservation of plant diversity areas in the region as protected forests and Biosphere Reserves are suggested.	The species with its corymbs of white flowers during. May looks elegant and could be grown as an ornamental shrub.	Not known	1. Rehder, A. (1935). *Huodendron,* a new genus of Styracaceae. *J. Arn. Arb.* 16 : 344- . 345. 2. Sastry, A. R. K. (1967). *Alniphyllum* Mats. and *Huodendron* Rehder-Two additional generic records to the Indian Styraceae. *Bull. Bot. Surv. India* 9 : 297-298. Fig. 2. 3. Smith, W. W. (1920). *Styrax biaristatus* W. W. Sm. *Notes Roy. Bot. Gard. Edinburgh* 12 : 233.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
132	*Nardostachys grandiflora* DC.	Dwarf hairy herbs with a long tap root inhabiting alpine Himalayas at an altitude of 3000 to 5000 m	None.	Collection of this plant should be banned: Attempts should be made to cultivate this 'plant for its commercial exploitation. Some of its habitats should be conserved.	The plant is propagated by cuttings of rhizomes which are used in medicine and perfumery. Rhizomes are also used as tonic, stimulant laxative, diuretic, spasmodic, stomachic, etc. Medicinal oils prepared from rhizomes are reported to promote the growth of hairs and also to impart black colour	Not known in cultivation.	1. Anon. (1966). *The Wealth of India : Raw materials* 7: 3. 2.Basu, B. D. (1918). *Indian Medicinal Plants,* Part. II. Plate 509 B.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
133	*Athyrium duthei* (Bedd.) Bedd.	Terrestrial; growing along the margins of forests in semi-shaded situations along streams, rivers and water courses.	None.	Extensive field exploration by the specialists for locating the species and collection of live plants from the field and its cultivation in botanic gardens and conservatories maybe undertaken.	It is of academic interest. Confined to the Indian region only.	Not known. It can be planted as a pot plant in shaded cool parts in botanic the gardens and can be easily cultivated, like many other ferns.	1. Beddome, R. H. (1883). *A Handbook to the Ferns of British India; Ceylon and Malay Peninsula.* 2. Dixit, R. D. (1983). Rare and interesting Pteridophytes of India-II. *In:* Jain, S.K.& Rao, R. R. (ed:) *An Assessment* of *Threatened Plants of India,* p. 331. Botanical Survey of India, Howrah.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.

134	*Dennstaedtia elwesii* (Bak.) Bedd.	Grows rn hill slopes at an altitude of *ca* 2700 m.	None.	Attempts to grow the species from live plants and spores obtained from China in botanical gardens and reintroduction of the species in its original habitat at Lachen in North Sikkim be made.			1. Baker, J. G. (1874). *Synopsis Filicum,* p. 54. (2nd ed.). 2. Beddome, R. H. (1876). *The Ferns of Brit. India, suppl.* 2. t. 347. 3. Beddome, R. H. (1883). *A Handbook to the Ferns of British India, Ceylon and Malay Peninsula,* p. 26. 4. Clarke, C. B. (1880). A review of fems of North India. *Trans, Linn. Soc.* ser. 2. Bot. 1 : 436. 5. Ching, R. C. (1959). *Fl. Reip. Pop. Sinica* 2 : 200. 6. Iwatsuki, K. (1975). *Pteridaceae. In:* Hara, H.(ed.). *Fl. East. Himal.,* vol. 3. 7. Mehra, P. N. & Bir, S. S. (1964). The pteridophytic flora of Darjeeling and Sikkim Himalayas. *Res. Bull. Punjab Univ.* (N. S.), p.15. 8. Tagawa, M. (1965). *Pteridaceae. In:* Hara, H. (ed.). *Fl. East. Himal.,* vol. 1. 9. Tagawa,M.(1971). *Pteridaceae. In: Hara,H.(ed.).FI.East.Himal.,vol.2.*	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
135	*Christiopteris tricuspis* (Hook.) Christ.	A terrestrial fern of high altitudes in sub-tropical and sub-temperate Himalayan forests.	None.	Intensive search to relocate the species in its distribu- tion range and if found attempts should be made to grow the plants *ex situ* for multiplication, protection and re-introduction in its distribution areas.	No information.		1. Beddome, R. H. (1883). *A Handbook to the Ferns of British India, Ceylon & Malay Peninsula,* p. 434, f. 263. 2. Christensen, C. (1906). *Index Filicum* 20: 388. 3. Clarke, C. B. (1880). A review of the ferns of Northern India. *Trans. Linn. Soc.* ser. 2. Bot. 1. 4. Holttum, R. E. (1954). A *revised flora of Malay.. Ferns* 2 : 211. 5. Hooker, W. J. (1864). *Species Filicum* 5 : 272, t. 304. 6. Iwatsuki, K. (1975). *Polypodiaceae. In..* Hara, H. (ed.). *Fl. East. Himal.,* vol. 3. 7. Mehra, P. N. & Bir, S. S. (1964). The Pteridophytic flora of Darjeeling and Sikkim - Himalayas. *Res. Bull. Punj. Univ.* (N.S.), p. 15. 8. Tagwa, M. (1966 & 1971). *Polypodiaceae.In..* Hara, H. (ed.). *Fl. East. Himal.,* vols.1 &2. The material for this sheet was supplied by S. R. Ghosh, Botanical Survey of India, Howrah.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
136	*Drynaria meeboldii* Rosenst.	Epiphytic. Grows in semishade conditions amongst rock boulders near streams and rivers in between 1000-1500 m altitude.	None.	Technopol district of Manipur is to be declared reserve forest area and shifting cultivation should be totally stopped	No information; of botanical and distributional interest.		1. Christensen, C. (1913-16). *Index Filicum,* suppl. 2 : 13. 2. Rosenstock, E. (1913). Filices novae in India orientalia cl. A. Meeboldio collectae. *Fedd. Repert.* 12 : 248.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.

137	*Oreopteris elwesii* (Bak.) Holtt.	Grows on open hill slopes in between 2700-4200 m altitudes.	None.	Protection of certain plant diversity areas in N. Sikkim and *ex situ* conservation of the species in botanic gardens should be considered. Biology and Potential Value: No information	No Information	No Information	1. Baker, J. G. (1874). *Synopsis Filicum,* p. 497. (2nd ed.) 2. Dixit, R. D. & Ghosh, S. R. (1985). *Oreopteris elwesii* (Bak.) Holttum-A poorly known endemic fern, rediscovered. *Bull. Bot. Surv. India* 26 : 228-230. 3. Holttum, R. E. (1981). The genus *Oreopteris* (Thelypteridaceae). *KewBull.* 36 (2) : 223-226. 4. Mehra, P. N. & Bir, S. S. (1964). The pteridophytic flora of Darjeeling and Sikkim Himalayas. *Res. Bull. Punj. Univ.* (N.S.) 15 : 150.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
138	*Hedysarum astragaloides* Benth. ex Baker	On grassy and shady mountain slopes at 3500-4500 malt.	None for the wild plants and its habitats except that the species has been listed as threatened (2).	Efforts should be made to search its known localities and other likely areas to determine the status of its populations. The species should be brought. into cultivation and propagated in botanic gardens.	Nothing is recorded of its biology. It may be of interest as an ornamental plant of higher altitudes and temperate parts.	Not known.	1. Ohashi, H. & Tateishi, Y. (1975). The genus *Hedysarum* (Leguminosae) in the Himalayas. *Bull. Univ. Mus. Univ. Tokyo* 8.: 363-392, pl. 12a, fig. 56. 2. Pramanik, A. & Thothathri, K. (1983). Studies on rare and endemic legumes in the tribe *Hedysareae. In:* Jain, S.K. & Rao, R.R. (ed.). *An Assessment of Threatened Plants of India,* pp. 232-234. Botanical Survey of India, Howrah.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
139	*Hedysarum cachemirianum* Benth. ex Baker	On dry stony, shady mountain slopes at 3700-4000 m, more or less devoid of vegetation.	No steps have been taken for in situ or ex situ conservation of the species; it is only listed in threatened plants lists of India. (1, 3).	Selection of areas for reserves in Kashmir should include sites where the species occurs; possible reintroduction of the species into conservation areas. Further search of the species in Kashmir and adjoining areas.	Nothing in record. This species is of scientific interest on account of its geographical isolation and could be of horticultural and botanical value as well, in higher altitudes. .	Cultivation of this species probably has never been attempted.	1. Jain, S.K. & Sastry, A.R.K. (1980). *Threatened Plants of India. A State-of-the Art Report.* p. 24. Botanical Survey of India, Howrah. 2. Ohashi, H. & Tateishi, Y. (1975). The genus *Hedysarum* (Leguminosae) in the Himalayas. *Bull. Univ. Mus. Univ. Tokyo* 8: 363-392. pl., 12d, .fig. 57, 70a,71a. 3. Pramanik, A. & Thothathri, K. (1983). Studies on rare and endemic legumes in the tribe *Hedysareae. In:* Jain, S.K. & R.R. Rao (ed.). *An Assessment of Threatened Plants of India,* pp. 232-234. Botanical Survey of India, Howrah.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.
140	*Hedysarum microcalyx* Baker	The species is found on steep rocky wet places or on banks of streams in shade, between 3000 and 4800 m.	None for the wild populations and its habitats; the species has been enlisted in threatened plant lists of India.	Protection should be provided for as many of the existing natural sites as possible. The species should, if possible, be brought - into cultivation.	It is a very attractive, robust perennial mountain-herb with strikingly beautiful purple, purplish red or crimson-purple flowers which would make it a worthwhile introduction as an ornamental plant in high altitude botanic gardens, besides being botanical interest.	Cultivation of this species was attempted sometimes in 1886 at Kew Garden, however, its identity is doubtful (1).	1. Ohashi, H. & Tateishi, Y. (1975). The genus *Hedysarum* (Leguminosae) in the Hima-layas. *Bull. Univ. Mus. Univ. Tokyo* 8: 363-392. pl. 12c, f. 64. 70b. 2. Pramanik, A. & Thothathri, K. (1983). Studies on rare and endemic legumes in the tribe *Hedysareae. In:* Jain S. K. & R. R. Rao (ed.) *An Assessment of Threatened Plants of India,* pp. 232-234. Botanical Survey of India, Howrah.	Red Data Book of Indian Plants Vol.2, 1990. M.P. Nayar & A.R.K. Sastry.

141	*Allium stracheyi* Baker	In the altitudes of 2400-2700 m on dry open mountain slopes.	None so far	Intensive search for the species in the region and adequate protection to its natural habitats and introduction into cultivation in the Western Himalayan areas are suggested	of botanical interest. Like other Alliums this may have culinary and medicinal importance. All wild species of *Allium* are of germplasm value and need to be investigated for medicinal purpose	Not Known	(1) Baker, J.G. (1874). On the *Alliums* of India, China and Japan. *J. Botany* 12 :293. (2) Staern, W.T. (1960). Allium & Milula in the Central and Eastern Himalaya. Bull. Brit. Mus. Nat. Hist. 2: 174.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
142	*Calamus inermis* T. Anders	A plant component of moist tropical forests, grows along shaded *Jhoras* , in ravines, in association with *Eupetorium odoratum, Clerodendrum viscosum* and several species of ferns and aroids.	Forest department has recently increased the cutting cycle from 3 years to 5 years for facilitating natural regeneration by suckers.	Efforts should be made by the Forest department to grow this rattan species through Silviculture programmes.	It is one of the elite canes of the eastern India and has immense commercial value. Mostrly utilised by furniture making industries. Strong unbent canes are used as Batton Sticks.	Not in cultivation	1. Anderson, T. (1869). An enumeration of the Palms of Sikkim. J. Linn. Soc. (Botany) 11: 4-14. 2. Beccari, O. (1908). Asiatic Palms. *Ann. Roy. Bot. Gard. Calcutta* 11: 436. 3. Basu, S.K. (1986). Threatened palms of India-some case studies. *J. Econ. Tax. Bot. 7;* 494-497	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
143	*Livistona jenkinsiana* Griff. (Assam Fan Palm	Grows in the moist forests upto 1000m. In Arunachal Pradesh it grows in association with wild Musa sp.	None for species. However, some of its distribution areas in the Arunachal Pradesh and Meghalaya are now included in the Namdapha and Nokrek Biosphere Reserves, respectively.	For protecting the wild populations from over-exploitation of its leaves for thatch and stem for making huts, this useful palm has to be intorduced for cultivation in tribal populated areas of north-eastern India. This plam can also be introduced in Botanic Gardens.	Apart from its usefulness to the tribal communities, this palm is the only endemic species of the genus distributed in India. It is one of the finest fan palm and can be cultivated indoors as pot plant for ornamental purpose. The endosperm of the seed is also edible. It is reported that about 500-700 leaves are required for thatching a hut which necessiates exploitation of 100 plants.	Cultivated in the Lloyd Botanic Garden, Darjeeling. A few young plants are being grown in the Indian Botanic Garden, Howrah.	1. Anderson, T. (1869). An enumeration of the Palms of Sikkim. *J. Linn. Soc* . 11: 4-14. 2. Beccari, O. & Hooker, J.D. (1892-93). Fl. Brit. India 6: 402-483. 3. Griffith, W. (1845). Palms of British East India. *Calcutta J. Nat. Hist.* 5:334-336. 4. Rolla, S.R. & Joseph, J. (1962). *Livistona Jenkinsiana. Principes* 6: 103-106. 5. Basu, S.K. (1986). Threatened Palms of India-Some case studies. *J.Econ. Tax. Bot.* 7:494-497.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
144	*Phoenix rupicola* T. Anders	Grows as isolated strands in rocky clefts below 450 m.	None at present.	Reintroduction into the depleted habitats and introduction of the species into Botaincal gardens for *ex situ* conservation.	Very ornamental in appearance. Unlike other date palms its leaves are soft and not stiffly spinuous at base, therefore can be grown as indoor potted plant. Ripe fruits are edible. Core of the stem is also edible.	Not common in cultivation. A few trees are seen in the Indian Botanic Garden, Howrah and elsewhere (4).	1. Anderson, T. (1971). An enumeration of the Palms of Sikkim. *J. Linn. Soc.* 11:13. 2. Beccari, O. & Hooker, J.D. (1892). *Fl. Brit. India* 6:425. 3. Mababale, T.S. & Parthasarathy, M.V. (1963). The genus Phoenix *Linn.* in India. *j.Bombay Nat. Hist. Soc.* 60 : 371-387. 4. Basu, S.K. (1986). Threatened Palms of India-Some case studies. *J. Econ. Tax. Bot.* 7: 493-497.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
145	*Chondrilla setulosa* Clarke ex Hook. F.	Grows on exposed grassy hill slopes, ascending upto 2800m.	None so far	intensive search for the species in the type locality and adjacent areas and conservation of its populations, habitats should be undertaken.	Apart from its botanical interest nothing is known. Fls. & Frs. : July-September	So far not known.	1. Hooker, J.D. (1881). Fl. Brit. India 3: 402. 2. Rao, R.R. *etal* 1988). *Fl. Indicae Enumer. Asteraceae,* p.23. Botanical Survey of India, Calcutta.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry

146	*Senecio mishmi* Clarke	On dry, exposed hilly slopes	None so far	The first priority is to find out its populations; the distribution localities should be given the full protection against any sort of biotic disturbances for *in situ* preservation. The species should also be introduced into experimental gardens.	Not known	None	1.Clarke,C.B. (1876). *Comp.Ind.* 2. Clarke, C.B. (1881) : *In*: Hooker, J.D., *Fl. Brit. India* 3 : 344. 3. Rao, R.R. etal (1988). *Fl. Indicae Enumer.*-*Asteraceae* , p.70. Botanical Survey of India, Calcutta.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
147	*Senecio rhabdos* Clarke	On exposed hill slopes at 1500-1850 m.	None so far	Needs intensive search in the type locality and near by localities. The species should also be introduced in the experimental gardens for *ex situ* conservation	Not known so far	Not known so far	1. Clarke, C.B. (1889). *J.Linn.* 25:40. t. 19. 2. Kanjilal, U. & Das, A. (1939). *Fl. Assam* 3:124. 3. Rao, R.R. etal (1988). *Fl. Indicae Enumer. Asteraceae,* p.70. Botanical Survey of India, Calcutta.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
148	*Synotis simonsii*		None so far	It is neecessary to survey the typelocality intensively; if relocated, the species, may be introduced in the experimental gardens	Clarke mentioned it to be a handsome shrub and the species in cultivation could be of ornamental potential.	None so far	1.Clarke,C.B. (1876). *Comp.Ind* 2. Clarke, C.B. (1881) : In: Hooker, J.D., *Fl. Brit. India* 3 : 344. 3. Kanjilal, U. & Das, A. (1939). *Fl. Assam* 3:124. 4. Rao, R.R. *et al* (1988). *Fl. Indicae Enumer. Asteraceae,* p.75. Botanical Survey of India, Calcutta.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
149	*Begonia aborensis* Dunn	rows on old overgrown clearings and extending just to the plains above Rotung at an alt. 300 In between Kebang and Dihong.	None on record	Protection of its known localities, collection of live - plants and seeds, cultivation in botanic gardens and propagation through seeds in its natural distribution range.	A herb with beautiful flowers blooming during January. Several species of *Begonia* are prized in horticulatural trade for their foliage and flowers.	his species was cultivated in the Lloyd Botanic Garden at Darjeeling when the plant was discovered.	1. Dunn, S. T. (1920). Kew Bul. 1920: 110.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
150	*Begonia brevicaulis* DC.	Reported growing in the altitude ca 300 m in the moist shady forest undergrowth.	Not taken	Intensive search should be made to re-locate the species from the above area. If it is rediscovered from any locality, its natural habitats should be protected and the species should be introduced into conservatories and experimental gardens.	Not known but this curious species may prove to be of horticultural interest.	Not cultivated anywhere.	1. Clarke, C. B. (1879). *Tn:* Hooker, J. D., *El. Brit. India* 2: 647. 2. De Candolle, A. (1859). *Ann. Sc. Nal.* ser. 4. 11 : 135. 3. De Candolle, A. (1864). *Reg. Veg. Prod.* 15.1 : 350.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
151	*Begonia burkillii* Dunn	Recorded on rocks by streains in the outer hills, in dense evergreen forests at 300-1000 m altitude	None on record	Intensive efforts should be made to relocate the plant and thereafter to introduce in botanic garden or experimental garden.	Its beautiful flowers deserve attention for cultivation as an ornamental plant. It is known that female flowers appear three weeks after the male flowers.	Not known to have been cultivated anywhere	I. Dunn, S. T. (1920). *Kew Bull.* 1920: 110.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry

152	*Begonia lushaiensis* C.E.C. Fischer	Reported grow in the altitude ca 1300 m in the moist shady forest undergrowth.	None on record	Efforts should be made to find out whether it still remains in its type locality and adjoining region. If the species is located, its living plants should be planted in the horticultural gardens and propagation through seeds be tried, in botanic gardens.	It is a beautiful plant having more importance in horticulture. Flowers bright pink. Flowering and fruiting during. July to September.	Not in cultivation so far	1. Fischer, C. E.C. (1928). Kew Bull. 1928 : 273. 2. Fischer, C. F. E. (1938). Rec. Bot. Surv. India 12(2) : 98.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
153	*Begonia rubella* Buch.Ham. Ex D. Don	Grows on moist shady banks at an altitude of 600-1800 m	None	Search for the plants in its new locality; study of its biology and protection of its habitat are recommended.	This species has medicinal value. It is known that flowering and fruiting during June to September.	Not reported	I. Don, D. (1825). Prod. Fl. Nepalensis, p. 223. 2. Miquel, F. A. G. (1852). Analecta. Bot. Ind. 3 : 18.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
154	*Begonia rubrovenia* var. meisneri Clarke	Grows in between moist rocks, shaded places in forest floors usually along stream sides at an altitude of 1064 m.	None on record	Efforts should be made to find out still surviving populations in its type locality and adjoining regions in the upland. If located, the plants should be cultivated in the BSI experimental garden at Barapani near Shillong.	This taxon is of phytogeographical and botanical interest.	Nor recorded	1. Clarke, C. B. (1879). In: Hooker, J. D., FI. Brit. Inditl 2 : 645. 1879.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
155	*Begonia satrapis* Clarke	Grows on the slopes of Rungeet valley below Badamton at an altidude of 700 m.	Not known	Efforts should be made to collect the plant. If available, it should be cultivated in botanic garden at Darjeeling and in the BSI experimental garden at Gangtok	A herb with reniform leaves with 3 uniform wings and bright red peduncle with beautiful flowers blooming during August. It is of horticultural importance	None on record	1.Biswas,K. (1966). Plants of Darjeeling and the Sikkim Himalaya,p.382. 2. Clarke, C.B. (1879). *In:* Hooker, *J.D., Fl. Brit. India* 2:638.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
156	*Begonia scintillans* Dunn	Recorded around the mountain of Bapus, both on the south face and towards Wotung, between 1200-2000 maltitudes,	None on record	The type locality and neighbouring areas should be well explored. If the species is found, the rhizome should be planted in suitable eco- logical nitches in Abor Hills and introduced in botanic gardens:	Not known. However, several species of Begonia are horticulatural favourites.	Nor recorded any where	1. Dunn, S. T. (1920). Kew Bull. 1920: 111.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry

157	*Begonia scutata* Wall. ex DC.	Grows between 1000 to 1500 m altitudes.	So far none.	Thorough explorations should be conducted in the above areas and similar areas of Peninsular India to relocate the plants. If relocated, seeds should be collected, plants be reintroduced in the wild hebitats.	A very interesting species of disjunct distribution. It is known to flower during September.	No record so far.	I. Biswas, K. (1966). Plants of Darjeeling and Sikkim Himalaya, p. 377. 2. Clarke, C. B. (1879). In: Hooker, J. D., Fl. Brit. India 2 : 642. 3. De Candolle, A. (1864). Reg. Veg. Prod. 153 : 328. 4. Hara, H. (1966). Fl. East. Himul., p. 215. 5. Kurz, S. (1877). Journ. Asiat. Soc. Bengal. 2 : 108.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
158	*Begonia tessaricarpa* Clarke	None on record	None	Intensive search should be made to relocate the species from the above area for planning conservation measures. If located, its seedlings should be introduced in botanic gardens and conservatories .	Not known.	Not reported so far.	1. Clarke, C. B. (1879). In:Hooker,J.D., Fl.Brit. India 2 :636.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
159	*Belonia watti* Clarke	Not known	None	Serious efforts should be made to collect the species from its type locality; in situ preservation and cultivation in botanic gardens.	It is known to flower and fruit during September to October	Not recorded	1. Clarke, C. B. (1889). Journ. Linn. Soc. 25 : 26. t. 11. 2. Fischer, C. E. C. (1938). Rec. Bot. Surv. India 12 : 98.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
160	*Begonia wengeri* C. E. C. Fischer	Grows on moist shady banks, about 100 km south. of in the alt. 456-760 m, in dense patches as undergrowth of dense evergreen	None	The type locality and neighbouring areas should be searched thoroughly. If located, it should be introduced into botanic gardens. The area is rich in endemic species and some flora rich areas should be identified and declared as 'protected'.	It is a beautiful plant having pure white flowers and dense green leaves of horticultural importance. Flowers and fruiting during August.	None on record	1. Fischer, C. E. C. (1932). Kew Bull. 1932 : 200. 2. Fischer, C. E. C. (1938). Rec. Bot. Surv. India 12 : 98.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
161	*Capparis pachyphylla* Jacobs	In subtropical evergreen forests from 600-1200 In, on cliffs and banks or river gorges in dry exposed habitats.	No specific measures taken but the recently set up Namdapha Biosphere Reserve area includes areas of the two districts, 1.ohit and Tirap, and may inctude some or its habitats which are likely to be protected.	The species should be searched again and its seeds collected for propagation in the experimental gardens and botanic gardens. Efforts shoutd be made for propagation by natural or tissue culture methods and reintroduction into the original habitats.	One of the severat endemic species of the genus occur- ring in one of its main centres of speciation and hence is of botanical interest. Berries or several species of the genus are edible and known for medicinal value and hence this species is also of potential value.	Not known in cultivation; however, this can be grown in shaded places on rocky soil in subtropical climates.	Jacobs, M. (1965). The genus Capparis (Capparaceae) from lndus to Pacific. Blumca 12 : 385-541.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry

162	*Silene khasiana* Rohrb	Humid hilly regions, an mossy rocks and slopes, amidst under growth of forests.	Mauphlong is protected by local Khasi people as a 'Sacred forest' for several decades	Intensive search may be undertaken in the type locality. If relocated, it may be cultivated under proper cae, for its conservation.	Its flowering and fruiting is during July to August. Nothing is known about its potential value.	There is no record of its cultivation	1. Chowdhuri, P.K. (1957). *Notes Roy. Bot. Gard. Edin.* 22:251. 2. Edgeworth, M.P. & Hooker, J.D. (1874). *In:* Hooker, J.D., *Fl. Brit. India* 1:221. 3. Rohrb. (1869-70). *Linnaea* 36:258. 4. Williams, F.N. (1896). *J.Linn. Soc. Bot.* 32:94.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
163	*Silene vagans* Clarke	Moist hilly regions, on rocks and slopes. Flowers in November.	None on record	Intensive search in the type locality is needed to rediscover its populations that may still be surviving. If and when found out, protection of the plants in the original wild habitat is recommended	Apart from its botanical interest, nothing is known about its potential value.	Not known in cultivation	1. Chowdhuri, P.K. (1957). *Notes Roy. Bot. Gard. Edin. 22:253.* 2. Clarke, C.B. (1889). *Journ. Linn. Soc.* 25:95. 3. William, F.N. (1896). Journ. Linn. Soc. 32:95.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
164	*Kalanchoe rosens* Clarke	On sandstone rocks at 1500-1800m in alt	None on record	Deserve to be cultivated in Botanic Gardens as a plant of horticultural and medicianl importance	A showy horticultural plant. The thick juice from the leaves is used by the local people in snake bite. It should, therefore, be chemically in vestigated Fls. & February-April.	The local people in Nagaland cultivate very rarely as a pot plant and for use as an antidote in snake bites.	1. Clarke, C.B. (1889). On the plants of Kohima and Munneypore. *J.Linn. Soc.* 25:21.f.8. 3:327. 2. Deb, D.B. (1961). Dicotyledonous plants of Manipur Territory. *Bull. Bot. Surv. India* 3:327. 3. Kingdon-Ward, F.W. (1948). *Plant Hunting in Manipur,* pp. 146,204. London.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
165	*Scleria alta* Boeck	Not Known		Intensive search for the species and if collected attempts through *in situ* conservation	Not known	Not known	1.Boeckler, O. (1874). *Linnaea* 38: 485. 2.Clarke, C.B. (1894). *In:* Hooker, J.D., *Fl. Brit. India* 6:690. 3.Chandra, Veena (1981). *In:* Jain, S.K. & Rao, R.R. (ed.). *An assessment of Threatened Plants of Indi,* p.276. Botanical Survey of India, Howrah. 4. Kern, J.H. (1961). *Blumea* 11:164.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
166	*Elaeocarpus acuminatus* Wall. ex Mast.	Moist evergreen sub-tropical forest, in humid situations at an altitude of 1200 m.	The type locality is conserved due to local religious belief; the Mawsmai Forest is treated by local Khasi tribes as 'Sacred'.	Intensive search for the species in adjoining forests; if the plants are located, they should be introduced into the garden and arboretum of the Botanical Survey of India at Shillong and Barapani and into the other protected forest areas in Meghalaya.	Nothing is recorded about its biology; the species is of distributional interest due to its restricted geographical distribution and rarity; trees may be of timber value. Flowers during July-September and fruiting during October-December .	None on record.	1. Haridasan, K. & Rao, R. R. (1985). For. Fl. Meghalaya. Dehra Dun. 2. Rao, R. R. & Haridasan, K. (1983). Threatened plants of Meghalaya-a plea for conservation. In: Jain, S,. K. & Rao, R. R. (ed). An assessi11ent of Threatened Plants of India, pp. 94-103. Botanical Survey of India, Howrah.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry

167	*Elaeocarpus prunifolius* C. Muell. Mast	Moist evergreen and semi-evergreen forests between 900-1800m.	The localities are conserved due to religious belief of the tribal people of Meghalaya and Manipur and the forests are treated as 'Sacred'.	Intensive search for the species in other adjoining regions; if the plants are located, should be introduced and cultivated in the experimental gardens.	Nothing is recorded about its biology; the species is of restricted geographical distribution and rare; fruits are said to be edible, trees may be of timber value. Flowers during March-October.	None on record.	1.Balakrishnan,N.P. (1981). *Fl. Jowai* 1:105. Botanical Survey of India, Howrah. 2. Rao, R.R. & Haridasan K. (1983). Threatened plants of Meghalaya- a plea for conservation. *In:* Jain, S.K. & Rao, R.R. (ed.). *An assessment of Threatened Plants of India.* Botanical Survey of India, Howrah.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
168	*Gleditsia assamica* Bor	In open situations in evergreen forests. The entire distribution range in the N. E. India receives moderate to high rainfall annually and forest soils are rich in humus and loam. .	None so far. The recently established Nokrek and Balphakram Wildlife Sanctuaries cover some forest areas in Garo Hills, Meghalaya.	Location of the species in the type localities and in similar habitats near to known localities; on locating the habitats and the plants, measures should be taken to protect the sites and plants from the practice of "slash and burn cultivation" ; efforts to collect fruits and seeds for introduction and multiplication in experimental gardens.	The fruits of all the species of Gleditsia are rich in saponins. The potentiality of Gleditsia assalllic£1 in particular is not known. The species is recorded to produce flowers and fruits at irregular intervals of time, rather than every year .	Cultivated in arboretum of the Forest Research Institute, Dehra Dun.	I. Bor. N. L. (1938). Some new Indian flowering plants. lnd. For. Rec.2 : 231-233. 2. Robertson, K. R. & Y. T. Lee (1976). The genera of Caesalpinioideae (Leguminosae) in the South Eastern United States. J. Arn. Arb. 57 : 26- 32.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
169	*Pueraria bella* Prain	The species grows in evergreen forests in hilly regions between 200-1000m altitude. On one instance its was found growing amongst boulders in a dry river-bed.	None so far	An intensive search must be made to collect this species in its known range of distribution. If the search yields some population of this species, it must be accorded protection along witht its natural habitat, and its plants and seeds be introduced into suitable niches in a Namdapha Biosphere Reserve in the same area.	The plant was collected in flowering in August and December. The potential use of this particular plant are not known. However, some other species of the genus are found to be useful as food plants. The tuberous roots of these species are edible and often used locally as food especially during scarcity. Some of the related species are also used as medicine. It is possible that *P.bella has similar* potentiality.		1.Burkill, I.H. (1925). *Rec. Bot. Surv. India* 10 :271. 2.Pottinger & Prain, D. (1898). The Botany of Kachin Hills, North-East of Myitkyina. *Rec. Bot. Surv. India* 1(11) :239. 3. Prain, D. (1898). Descriptions of some new plants from the North-Eastern Frontiers of India. *Journ.Asiat. Soc. Bengal* 67:288. 4. Van der Maesen, L.J.G. (1985). Revision of the genus *Pueraria* DC. with some notes on *Teyleria* Backer (Leguminosae). *Agric. Univ. Wageningen Papers* 85:18.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
170	*Rhynchoglossum Iazulinum* Rao & Joseph	Occurs sporadically in small numbers in cool, shady, evergreen sub-tropical and temperate forest floors near springs and water courses, in the altitudes of 1250-1500m. The soils are deep, rich in humus.	None on record	Some plant diversity areas in the Kameng and Subansiri districts should be selected and protected as Natural areas, and plants of this species be rehabiliatated in such areas for *in situ* conservation, besides introducing them into botanic gardens in the region.	The species with about 30 cm long inflorescence having showy bright blue violet flowers can be of horticultural importance. Fls.& frs.: September-November.			Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry

171	*Juncus sikkimensis* Hook.f.	A perennial herb found at higher altitudes (4000-4500m). Nothing is known about its ecology	None	Attempts should be made to grow it from the seeds.	Nothing is recorded	No attempt made so far	Buchanan, Fr. (1906). Juncaceae. *In: Engler, A., Das Pflanzenr. Heft.* 25:IV.36:234. 2. Hooker, J.D. (1892). *Fl. Brit. India* 6:399.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
172	*Lagerstroemia minuticarpa* Debberm. ex. P. C. Kanjilal	This species was collected from the subtropical forest of Assam at 100- 120 m alt. and from hills of Sikkim 1200-1500 m alt.	No conservation measure has been taken to protect the species in its habitats so far .	Efforts should be made to locate them in the type locality to raise plants from seeds for introducing in botanic gardens.	Use and potential value of this species are not known. But in the case of other species of Lagerstroemia the timber is useful and some are grown for their beautiful flowers. This flowers during August-October; fruits throughout the cold season.	This species is not known so far in cultivation.	1.Furtado, C. X. & Srisuko, M. (1969). Gard. Bull. Singapore 24 : 287. 2. Kanjilal, P. C. (1934). Assam For. Rec. Bot. 1 : 9. 3. Kanjilal, U. N. et al. (1938). Fl. Assam 2 : 311.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
173	*Aibertisia mecisfophylta* (Mlers) Forman	Data not available; but it is likely that the species grows in the evergreen forests on trees, at low altitudes.	None.	Further botanical explorations in these areas and adjacent areas following Griffith's itinerary, to collect this species, if still surviving. If located, it must be introduced for propagation and further studies into botanical gardens.	A climber of botanical and distributional interest.		1.Forman, L. L. (1975). Kew Bull. 30 (1) : 84. 2.Kanjilal, U. N. et al (1934). Fl. Assam. 3.Balakrishllan, N. P. (1981). Fl. Jowai 1 : Botanical Survey of India, Howrah. 4.Haridasan, K. & R. R. Rao (1985). For. Fl. Meghalaya.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
174	*Cyclea debiliflora* Miers	Subtropical evergreen forest, between 600-1200 m altitudes.	Nokrek and Balphakram areas in Meghalaya are now protected as reserves. The Sacred Groves in Meghalaya form the last refugia of many a rare species.	Exploration of the type locality and adjacent areas to collect this species; if located, the species must be introduced for propagation and further studies into botanical gardens as also into the Sacred Groves in Meghalaya.	Flowers and fruits in May. A climber of botanical interest.		1.Balakrishnan, N. P. (1981). Fl. Jowai. I. Botanical Survey of India, Howrah. 2.Haridasan, K. & R. R. Rao (1985). For. Fl. Meghalaya. 3.Kanjilal, U. N. et al (1934). Fl. Assam 1. 4.Miers, J. (1871). Contrib. Bot. 3 : 242.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
175	*Cyclca watti* Diels	No data available	None	Exploration in the type locality and adjacent areas to search out this species. It must be introduced into botanical gardens for propagation and further studies, if located.	Flowers in May. Fruits not known. A climber of botanical and distributional interest.		1. Diels, F.L.E. (1910). In: Engler, A., Das Pflanzenr. IV. 94: 320.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry

176	*Vanda coerulea* Griff. ex Lindl.	Found growing in mixed pine forests on hills between 1300. 2000 m altitudes, usually on Quercus spp.	This species is included in the Appendix I of CITES and its trade is totally banned. A few sets of the spccies are under ex situ conservation in the National orchidaria of the BSI at Shillong, Barapani, Yercaud and in some private nurseries and orchidarium of the Arunachal Pradesh State Govt., at Tipi.	Monitoring of all existing wild populations and protecting their natural habitats is the foremost requirement. Except for scientific studies, collection of this species from the wild must be totally stopped. The species must be well stocked in botanical gardens, conservatories and local orchidaria for ex situ conservation.	Flowering and fruiting period is September-February, with peak flowering season being October-November. The species is rated high in breeding new horticultural varieties. It has been widely used in the breeding of hybrid novelties like Vanda rothschildiana, which is highly valued in horticulture trade. Immense scope yet remains to fully exploit the potential of this species through interspecific or intergeneric hybridisation.	It is locally cultivated although its natural populations have been much depleted in the past.	1. Balakrishnan, N. P. (1983): Fl. Jowai 2 : 481. 2. Hooker, J. D. (1890). FI. Brit. India 6 : 51. 3. Kataki, S. K., lain, S. K. & Sastry, A. R. K. (1984). Threatened and Endemic orchid of Sikkim and North East India. Posscef, Botanical Survey of Inclia, Howrah. 4. Pradhan, U. C. (1979). Indian Orchids: Guide to Identification and Culture 2: 567.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
177	*Argostemma khasianum* Clarke	Rocky moist places in forest floors in the alt. of 1000-1500 m.	None.	Efforts should be made to collect the plants from the type locality and introduce the species in the protected sanctuaries and sacred groves in Meghalaya.	A plant of academic interest. Its biology is not studied thoroughly. Flowers during July-December.	Not in cultivation.	1.Clarke, C. B. (1880). In: Hooker, J. D., Fl. Brit. India 3 : 43. 2.Balakrishnan, N. P. (1981). Fl. Jowai 1 : 243.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
178	*Indopolysolenia wallichii* (Hook.f.) Bennet	I moist shady floors of the forest at 600-900 m	None for the species; however, it is likely the species may be growing in the protected forest groves in the area.	Efforts should be made to collect the plants from its distributional localities and introduce them in the protected sacred groves in the region.	A plant of botanical and distributional interest; fls. & frs during June-December	Not known in cultivation	1.Bennet, S.S.R. (1981). *Ind. For.* 107 (7) : 437. 2. Hooker, J.D. (1873). *In* : Bentham, G. & Hooker, J.D., *Gen. Plant.* 2:68. 3. Hooker, J.D. (1880). *Fl. Brit. Indian* 3:94. 4. Kanjilal, U.N. *et.al. (1939). Fl. Assam* 3: 49. 5. Robberecht, E. (1988). *Opera Bot. Belgica* 1: 158 6. Santapau, H. & Henry, A.N. (1973). *Dict. Fl. Pl.* Indian, p. 136. CSIR, New Delhi.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
179	*Neanotis oxyphylla* (G.Don) Lewis	In swampy hilly soils upto 1824 m alt., growing on muddy banks or on bouldcrs along streams. Plants often remain surmerged.	Meghalaya encompasses the Balphakram Wildlife Sanctuary, Nokrek Biosphere Reserve and some Sacred Groves, the areas of which are protected from althropogenic activities.	Efforts should be made to collect the plants and cultivate in botanical gardens and to perpetuate natural survival of populations of this species in its habitats.	A plant of botanical interest.	Not yet known	1.Don, G. (1834). Gen. Syt. Gard. Bot. 3 : 531. 2. Hooker, J. D. (1880). El. Brit. lndia 3 : 72. 3.Kanjilal, U. N. et al (1939). Fl. Assam 3 : 40. 4.Lewis, W. H. (1966). Ami. Miss. Bot. Gard. 53 : 39.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry

180	*Cleyera japonica* Thunb. var. grandiflora (Wall. ex Choisy) Kobuski	Evergreen forested hills at 1900 m altitude. The area receives high rainfall up to 1200 cm annually.	he forests ,at Mausmai and Shillong Peak are preserved as 'sacred groves' due to religious belief; however there is no recent report of this plant from this area also.	The known range of distribution of this taxon has been fairly botanised during recent past, but this could not be collected/located in this natural habitat. Yet further intensive search is required and if found the plants may be collected and introduced into the garden at Woodlands, Shillong and Barapani Arboretum, BSI, for its regeneration.	Flowering and fruiting: July to November. The plant is of botanical and phytogeographical interest. The wood is reportedly heavy, very fine and hard.	None on record.	1. Haridasan, K. & R. R. Rao (1985). For. Fl. Meghalaya 1 : 116. 2. Dyer, W. T. Thisleton (l874). In: Hooker, J. D. Fl. Brit. India 1 : 284 (as grandiflora Hook. f. & Thorns. ex Dyer) 3. Kanjilal U, N. et al (1934). Fl. Assam 1 : 116.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
181	*Pyrenaria khasiana* R.N. Paul	Subtropical evergreen forest, between 600-1200 m altitudes.	Balphakram area is a wildlife sanctuary; Nokrek (Tura range) is a Biosphere Reserve, besides some sacred groves in the region, which may offere protection to the species.	Exploration of the type locality and its vicinity to collect this species. If located, it must be introduced into botanical gardens for propagation and further studies and also into the existing sanctuaries, Biosphere Reserve and Sacred groves which will provide scope for its conservation in its distribution range.	Flowers not known. Fruits in May. A shrubby species of botanical interest.		1.Paul, R.N. (1979). *Bull.Bot.Soc. Bengal.* 33:115. 2. Balakrishnan, N.P. (1981). *Fl. Jawai* 1:90-94. 3. Haridasan, K. & R.R. Rao (1985). *For. Fl. Meghalaya.* Vol.I	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
182	*Cissus spectabitis* (Kurz) Planchon	In damp forests.		A thorough search for the species should be made and measures taken for in situ and ex situ conservation, if located.	It is an endemic species confined to a very small area.	Not known in cultivation.	1. Lawson, M. A. (1875). In: Hooker, J. D., El. Brit. India 1 : 649. (as Vitis spectabilis Kurz).	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
183	*Christella clarkei* (Bedd.) Holtt.	Along streams among rock boulders, at high altitudes.	Nil	Specific survey for its collection is required to ascertain its range of distribution. *Ex.situ* conservation of its plants in conservatories recommended.	Not known		1.Beddome, R.H. (1982). *A handbook to the Ferns of British India, Ceylon and Malaya Peninsula with supplement.* 2. Dixit, R.D. (1984). *A census of the Indian Pteridophytes.* Botanical Survey of India, Calcutta. 3. Holttum, R.E. (1977). The genus *Christella.* Studies in the family Thelypteridaceae-XI. *Kew Bull* 31:308. 4. Nayar, B.K.& Kaur, S. (1974). *Companion to R.H. Beddome's Handbook to the Ferns of British India, Ceylon and Malaya Peninsula.*	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
184	*Christella kaumaunica* Holtt.	Terrestrial, among rocks along streams.	Nil	Intensive search is required to trace out the species from Kumaun to recommend conservation measures.	No information.		1. Chandra, S. (1982). Checklist of ferns endemic to India. Nov. Hedw. 36: 241-247. 2. Holttum, R. E. (1977). The genus Christella Lev., sect. Christella. Studies in the family Thelypteridaceae-XI. Kew Bull. 31(2) : 318.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry

185	*Coryphopteris didymochlaenoides* (Clarke) Holtt.	Terrestrial, growing in mountainous gorges 1500 m deep in forests along streams.	Nil.	The habitats should be protected and the species should be introduced into the conservatory of the BSI at Barapani near Shillong.	No information.	Not in cultivation.	1. Beddome, R. H. (1892). A Handbook to the Ferns of British India, Ceylon and Malaya Peninsula with supplement. 2. Nayar, B. K. & Kaur, S. (1974). Companion to R. H. Beddome's Ferns of British India, Ceylon and Malaya Peninsula.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
186	*Cyclogramma squaniaestipes* (Clarke) Tagawa	Along streams as undergrowth of forests	Nil	Sikkim, the Northeastern hill states and Arunachal Pradesh abound in many rare and endemic tree ferns and other lower groups of vascular plants and harbour in all about 500 species of peteridophytes representing the richest diversity for India. Due to loss of habitats, tree felling and ecological imbalances in this region, many of these species are threatened. A National Pteridophytes Sanctuary should be established and developed for *in situ* conservation of this rich diversity of flora of our country.	No information. It is generally seen that ferns are resistant to diseases of fungi, bacteria and viruses and thus may prove to be of potential value in preparing biological pest control chemicals.		1. Clarke,C.B. (1880). A review of the ferns of Northern India. *Trans.Linn.Soc. Lond., Bot.* 1:514. 2.Tagawa, M. (1938). *Cyclogramma,* a new fern genus. *Acta Phytotax, Geobot.* 7:55.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry
187	*Metathelypteris decipiens* (Clarke) Ching	Terrestrial along streams in the undergrowth of the forests.	Nil	Collection of the species from the wild and introduction in conservatories at Shillong and Barapani and *in situ* conservation of its populations are suggested	Not known		1.Beddome, R.H. (1982). A handbook to the Ferns of British India, Ceylon and Malaya Peninsula with supplement. 2. Clarke,C.B. (1880). A review of the ferns of Northern India. *Trans. Linn.Soc.Lond. II. Ser. 2. Bot.* 1:514. t. 65. f.2. 3. Ching, R.C. (1963). A reclassification of the family Thelypteridaceae from the mainland of India. *Acta phytotax. Sin.* 8: 306.	Red Data Book of Indian Plants Vol. 3, 1990. M.P. Nayar & A.R.K. Sastry