

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

Sr. No.	Botanical Name	Family	Status	Distribution	Causes of Depletion	Description
1	<i>Acer caesium</i> Wall. ex Brandis	ACERACEAE	Vulnerable	India; Western Himalaya from Kashmir to Kumaon covering Jammu & Kashmir, Himachal Pradesh and Uttar Pradesh (8).	Causes for its depletion are largely due to its over-exploitation for industrial use (2, 6) and increasing manifold use by local people in the Western Himalayas (1).	Large deciduous broad-leaved trees, andromonoecious. Dormant flower buds large and prominent. Leaves 8-18 X 10-20 cm, palmately 5-lobed, upper surface green, lower surface characteristically caesio-pruinose, base deeply cordate, 5-nerved, leaf lobes caudate-acuminate, petioles 6-15 cm long, reddish. Inflorescence corymbose-panicle, erect, terminal, puberulous, appearing after the leaves. Flowers pale greenish-yellow to yellow. Sepals longer than petals. Stamens 8, inserted into the disc, exserted. Ovary pubescent, style 2, connate half way up. Fruit a samara, samara wings slightly divergent.
2	<i>Acer hookeri</i> Miquel var. <i>majus</i> Pax	ACERACEAE	Endangered	India, endemic to Sikkim and Darjeeling district of West Bengal. It was collected from a place between Rirhi and Rinchingpong, Sikkim (with altitude range from 600 to 1500 m).	Causes for its decline and possible extinction may be over-exploitation of forest flora for timber and firewood and massive deforestation for cultivation by hill people (1).	Trees, 12-16 m tall, andro-monoecious or dioecious. Branches green, whitish striped, later grey-brown. Leaves 10-14 x 5.5-8.5 cm, adult leaf coriaceous, margin imperfectly biserrate, serration less cuspidate, ovate, apex caudate-acuminate to cuspidate, base 5-nerved. Inflorescence appearing with leaves, bracteate, puberulous, brown to greenish-yellow. Flowers glabrous, yellow-green. Sepals and petals equal, 2.5-3.0 mm long. Fruit a samara, sub- horizontal, erect, nuts rounded, glabrous, wings straight.

3	<i>Acer oblongum</i> Wall. ex DC. var. <i>membranaceum</i> Banerji	ACERACEAE	Endangered	India, endemic to a single locality in Mussoorie in Uttar Pradesh (4). On two occasions G. King collected it from Mussoorie, one in 1869, another having no date. From, the same area P. W. Mackinnon collected it in 1896 and in 1899. Further collection of it either from the type locality or from elsewhere in the country is not reported.		Trees, 15-18 m tall, evergreen, andro-monoecious, buttressed at base, stems with elliptical white scars, bark smooth to wrinkled, white and green. Leaves membranaceous, base acute to subacute, dull red or reddish-brown, concoloured, 3-nerved, pubescent. In-florescence appearing with leaves, minutely pubescent. Flowers minute, 5-merous, greenish-white to yellow-green, 7.8 mm across. Sepals linear or lanceolate, 2.4 mm long. Petals elliptic-lanceolate, equal to or shorter than sepals. Stamens 8, inserted into the disc. Ovary densely hairy. Fruit a samara, 1-3 cm long, wings divergent. Flowering in March-April, 1m fruiting in April to September.
4	<i>Acer oblongum</i> Wall. ex DC. var. <i>microcarpum</i> Hiern	ACERACEAE	Endangered.	India, endemic to Mishmee Hills, Lohit district, Arunachal Pradesh.	causes for its decline or possible extinction may be due to factors mentioned in the report on <i>A. sikkimense</i> var. <i>serrulatum</i> (I).	Trees, 15-18 m tall, evergreen, andro-monoecious, buttressed at base, bark smooth to wrinkled, white and green. Leaves hartaceous, 5-12 x 3-5 cm, ovate-lanceolate, glabrescent, minutely reticulate, base rounded, 3-nerved. Inflorescence appearing with leaves, pubescent, lateral shoots 5-15 cm long. Flowers 5-merous, greenish-white to yellow-green, 7-8 mm across. Sepals linear or lanceolate, outside barbate, 2-4 mm long. Petals elliptic-lanceolate, equal to or shorter than sepals. Stamens 8, inserted on or inside the disc. Ovary densely pubescent. Fruit a samara, small, 1 cm long, wings divergent.

5	<i>Acer osmastonii</i> Gamble	ACERACEAE	Endangered	India. Endemic to a few restricted localities of Darjeeling district in West Bengal State, in the Eastern Himalaya. It was reported by B. B. Osmaston in 1903 from Salombong, Darjeeling (9) and later again by him from Birch Hill, Darjeeling in 1904. In 1915, C.E.A. Modder collected it from Darjeeling (deposited at CAL) and in 1958 by Ghose (6) from Mirik of the same district. From Birch Hill again Mehra <i>et al</i> (7) collected it in 1972. There is a report, however, of its recent collection (not later than 1963 as evidenced by sheet data) from Dehra Dun district, Uttar Pradesh (9).	Causes for its decline and possible extinction may be due to its restricted occurrence in a small pocket of Darjeeling Himalayan belt where rapid settlements by local hill people have replaced vast forest tracts.	Trees upto 30 m tall, polygamous. Branches olive to purplish-brown. Leaves 12-15 x 6-8 cm, glabrous above, thickly reticulate beneath, when lobed with 2-3 in upper half, lobes erect, ovate-lanceolate, apex long, caudate-acuminate, base rounded or slightly cordate, margin acutely serrate. Inflorescence pedunculate cymes in terminal panicles, 7-10 cm long. Flowers greenish to creamy yellow, 5-merous. Stamens 8, inserted inside the disc, of filaments subulate, anthers oblong, minutely papillose. Ovary silky-villose. Samaras erect to divergent.
6	<i>Acer sikkimense</i> Miquel var. <i>serrulatum</i> Pax	ACERACEAE	Endangered	India; endemic to Mishmee hills, Lohit district, Arunachal Pradesh. The taxon had been collected only once by Griffith possibly in 1837-38 (2) (Griffith 936) from Mishmee Hills and was determined by Pax in 1886 (5) as a variety of <i>A. sikkimense</i> . Since then no new collection has been reported from the area or elsewhere (4).	Causes for its decline or possible extinction may be due to its restricted occurrence in small pockets of Aru., nachal Pradesh which have become vulnerable due to exploitation of forests and deforestation for Jhum cultivation by the local Mishmee tribes (1).	Tall trees, andro-monoecious or dioecious; branches green to reddish-brown or grey. Leaves 9-17 X 7-9 cm, ovate, subcoriaceous, glabrous, dark green above, paler beneath, apex caudate to cuspidate, base subcordate to cordate, 5-nerved. Inflorescence appearing with leaves, bracteate, densely spicate. Flowers 5-merous, yellowish-green. Sepals lanceolate, 2 mm long. Petals short, 1.5-2.0 mm long. Stamens 8, filament 2.5-3.0 mm long. Ovary glabrous. Fruit a samara, 1.5-1.8 cm long, nuts globular, wings divergent, nearly straight, base narrowed.
7	<i>Trivalvaria kanjilali</i> D. Das	ANNONACEAE	Endangered	India, endemic to Meghalaya	The species is already on the decline to a greater extent, due to its slow regeneration and loss of habitat.	A shrub, 2-4 m high; leaves lanceolate, subacute or rounded at base, long acuminate, glabrous, 12-15 x 3.5-4 cm, lateral nerves 8-9 pairs, with 2-3 mm long petiole; flowers bisexual, pedicellate, solitary, axillary or terminal, pale green or yellow, 5-6 mm across. Stamens numerous, ca 1 mm long. Ovary many carpellary, superior with 1-ovule in each loculus; style curved with capitate stigma. Fruit sub-globose, red with solitary seed. Flowering: October-February.

8	<i>Heracleum jacquemontii</i> Clarke	APIACEAE	Indeterminate	India; endemic in North West Himalaya	Few branched, slender, erect villous herbs, 3- 7 dm tall. Leaves ovate, 5- 8 cm long, pinnate or tripartite, the 3 leaflets ovate, 2-3 cm long and <i>ca</i> 2 cm broad, acute or obtuse, sessile, serrate or lobed; upper cauline leaves reduced. Peduncles terminal or lateral, slender. Bracts inconspicuous. Rays 7-12, slender, unequal, 1.5-5 cm long. Pedicels , 10-12, 10-15 mm long, slender. Bracteoles 4-8, linear, 5-8 mm long. Flowers white, marginal petals radiant, emarginate. Fruit orbicular, <i>ca</i> 5 mm long and 3 mm broad, minutely pubescent, dorsal ribs filiform, laterals winged, wings much narrower than the body; vittae solitary at the valleculae extending nearly the length of the body, 4 on the commissure
9	<i>Pimpinella tongloensis</i> Mukh	APIACEAE	Endangered	India; endemic to Singaleela range in the Darjeeling-Sikkim Himalaya	Upto 1 m tall herbs with stems branched, hollow at internodes and striate. Basal leaves long petioled, trifoliolate, upper leaflet often trilobed, ovate in general outline; petioles to 8 cm long, crenate-dentate at margins, broadly cordate at base. Umbels terminal or axillary, peduncle to 10 cm long. Bracts absent. Rays 8-12, subequal, rigid, pilose, 1-3 cm. Bracteoles 3-5, <i>ca</i> 3 mm, linear. Pedicles 8-10, pilose, 3-6 mm. Calyx teeth triangular, minute. Petals white, obovate, inflexed at the apex. Fruits glabrous, urceolate, ribs obscure, <i>ca</i> 2x1.5 mm, vittae 2-3 at the valleculae, 2 at the commissure, commissure face plane; carpophore bipartite
10	<i>Pimpinella wallichii</i> Clarke	APIACEAE	Endangered	Sikkim in southern districts; Nepal (?). The types were collected from Heeloo and Hee in Sikkim, at an altitude of about 1450 m.	Erect, 30 to 150 cm tall herbs, glabrous, corymbosely branched above. Leaves ovate, ternately decomound, ultimate segments pinnatifid or 3-fid, narrowly lanceolate, 1-5 mm long, 1 mm broad. Bracts absent. Rays 6-12, very unequal, upto 1.5 cm long, rigid. Bracteoles 2-4, linear, <i>ca</i> 2 mm, or absent. Pedicles to 12 in number, 2.5 mm long. Fruit ellipsoid, laterally sub-compressed, glabrous, <i>ca</i> 1.5 x 2 mm, ribs prominent, subpentagonal in c.s., vittae 2-3 at the valleculae, 4 at the commissure, commissure face plane; carpophore bipartite

11	<i>Ptenopetalum radiatum</i> (W. W. Sm.) Mukh. (<i>Pimpinella radiata</i> W. W. Sm.)	APIACEAE	Indeterminate	India; endemic in north Sikkim at Yumtong and Sebu valley, at an altitude of about 3,500 m.		Slender, unbranched plants, to 30 cm tall, glabrous to scarcely hairy. Leaves petiolate, ovate or ovate-deltoid, ternate pinnate, 2.5-3.5 cm long and 2.5-4 cm broad. Leaflets ovate or ovate-lanceolate, 1-2 cm long and .8-1.2 cm broad, serrate or deeply incised. Upper leaves pinnately dissected. Umbels terminal and lateral. Rays 6-8, 1.2-3 cm long, subequal, spreading and ascending, filiform. Bracts nil. Bracteoles 1-2, setiform, to 1.5 mm long. Flowers not known. Pedicels 2-4, unequal, 0-3 mm. Fruit oblong-ovoid, 2 x 1 mm, terete in c.s., ribs obscure to filiform, glabrous, vittae solitary at the valleculae and 2 at the com- missure; carpophore bipartite.
12	<i>Wallichia triandra</i> (Joseph S. K. Basu)	ARECACEAE	Rare	Haylung, Wakroo near Glow Village in Lohit District, Arunachal Pradesh.		A clustering monocarpic palm, each stem covered with thick dark brown fibres; naked stem cane-like. Leaves unequally pinnetisect; leaflets trapezoid, silvery-white beneath. Staminate and pistillate inflorescences separately borne on the same plant. Male flowers with 3 distinct stamens. Fruit oblong to ellipsoid, 13 x 9 mm, deep red to dark purple when ripe.
13	<i>Catamixis baccharoides</i> Thoms	ASTERACEAE	Vulnerable	Endemic to the Siwalik belt and Tehri district of Garhwal Himalayas. Thomson.. first reported it in 1866. Perusal of herbarium specimens housed in the Indian herbaria (CAL, BSD & DO) shows that it was quite common in the Siwaliks in the recent past and formed an important component of the limestone vegetation. The extension of its distribution in Tehri district is based on a single report (1).	Causes for its decline are indiscriminate quarrying, mining and habitat destruction	Sclerophyllous undershrub, 1.0-1.5 m high. Stems with silky pubescence. Leaves alternate, shortly petiolate, semi-amplexicaul, obovate or obovate-spathulate, 5.0-7.5 X 2.0- 3.7 cm, crenate or crenate-serrate. Infl. in heads, ligulate, 7.5 mm long, in terminal corymbs. Involucral bracts few to many seriate, much shorter than flowers. Florets all ligulate, yellow or white. Achenes silky-villous. Pappus hairy, white.

14	<i>Inula kalapani</i> Clarke	ASTERACEAE	Rare	Endemic to Khasi hills of Meghalaya	The increasing demand of land for agriculture coupled by 'Jhum' practice in the Khasi hills make this species threatened in wild.	Perennial herb; stem brown, covered with white hairs. Radical and other lower leaves petioled, elliptic-ovate or lanceolate, obtuse to acute, both surfaces hairy, upper leaves cauline, sessile, more or less amplexicaulous, ovate-oblong, obtuse, midvein prominent, lateral veins 5-6, faint; flowers in heads of ca 2-2.5 cm across, involucre bracts ca 4-4.5 mm long, few, linear, acute, hairy outside. Achenes minute, ca 1 mm, glabrous, pappus few, ca 3 mm long with small side projections.
15	<i>Lactuca benthamii</i> Clarke	ASTERACEAE	Endangered	India, Kashmir		Stem erect, glabrous, minutely pubescent. Flowering branches ca 14-15 cm long, apex dichotomously corymbose. Leaves spatulate, oblong, decurrent to the petiole (narrowed towards petiole), entire or obscurely dentate, somewhat 3-nerved. Heads cylindrical, flowers many, all ligulate, purple. Inner involucre bracts about 8, oblong; outer involucre bracts smaller. Pappus in one series, bristly, dirty-white.
16	<i>Lactuca cooperi</i> Anthony	ASTERACEAE	Endangered	Sikkim Himalaya		Perennial herbs with long, woody rhizome. Stems absent or very short. Leaves all radical, rosulate, orbicular, glabrescent, entire or minutely remote-denticulate, about 2 X 2 cm; petioles ca 2 cm long, somewhat broad sheathed at base. Heads about 10-flowered, all ligulate, crowded, short peduncled, cylindrical. Involucre bracts about 6, linear oblong, ca 1.4x2 cm, pale green, membranous at margins, carinate, dorsally pilose, apex minutely white ciliate. Receptacle naked. Ligules yellow. Achenes ca 6 mm long, 9-ribbed, narrowed at base, hispid towards apex, distinctly constricted at beak. Pappus bearing cup-like disc, white, bristly.

17	<i>Lactuca filicina</i> Duthie ex Stebbins	ASTERACEAE	Endangered	Uttar Pradesh: Kumaon, Kali Valley, 1820-2430 malt.	Perennial herbs. Stems <i>ca</i> 60-100 cm tall. Cauline leaves numerous, 15-25 cm long, pinnatifid, segments lanceolate or linear, <i>ca</i> 3.5-5.5 cm long. Inflorescence cymose, paniculate; peduncle slender, bracteate. Involucre 13-14 mm long; bracts imbricate. Achenes blackish, <i>ca</i> 6 - 6.5 x 1 mm, beaked, beak pale, <i>ca</i> 1-1.5 mm long. Pappus bristly, <i>ca</i> 5.5 mm long, snow-white.
18	<i>Lactuca undulata</i> Ledeb.	ASTERACEAE	Endangered	Kashmir.	Annual herbs. Stem <i>ca</i> 15-35 cm high? glabrous or glaucous, succulent, stout, dichotomously branched from base. Leaves <i>ca</i> 1-7 x 0.5-2 cm, oblong-lanceolate, radical leaves sessile, narrowed at base, pinnatifid, lobes entire or sparingly toothed, cauline sessile, base dilated or auricled. Inflorescence sub-corymbose or terminal on the branches. Heads: <i>ca</i> 1.7-2.2 x 0.4-0.5 cm, erect, narrow, cylindric, sub-racemose, 2-3-flowered. Peduncle slender, bracteate; ligule white, pink or bluish. Outer involucrel bracts <i>ca</i> 3-5 x 1-1.5 mm, ovate, small, glabrous, gradually passing into inner, inner involucrel bracts <i>ca</i> 18-20x1.5-2.0 mm, unequal, finely glabrous, obtuse, oblong, much narrowed. Achenes including a long white capillary beak <i>ca</i> 13-14 mm, oblanceolate, compressed, transversely rugose, margins thickened, scabrid, glabrous, pale. Pappus <i>ca</i> 4-6 mm long, milky white.
19	<i>Saussurea clarkei</i> Hook. f.	ASTERACEAE	Rare	Kashmir Himalayas. Endemic.	Herbs, 10.0-15.0 cm tall, stout, pubescent. Leaves 10.0-12.5 cm, obovate, sharply toothed, membranous, puberulous above, cottony or glabrate beneath, sessile or winged petiole. Heads <i>ca</i> 0.8 cm across, in dense terminal cluster. Involucral bracts glabrate or cottony. Receptacle bristles longer than achenes.

20	<i>Berberis affinis</i> G. Don	BERBERIDACEAE	Rare	Uttar Pradesh (Kumaon). Endemic		Shrubs. Stems terete to subangled, pale-yellow. Spines absent or weak, concolorous. Leaves 4 - 8 x 1.2 cm, narrowly obovate to oblanceolate; apex narrowly acuminate or subacuminate; margins entire or 2 - 4 spinose. Racemes 1-25 flowered. Flowers yellow. Berries ovoid, stylose.
21	<i>Berberis kashmiriana</i> Ahrendt	BERBERIDACEAE	Rare	Jammu and Kashmir, Mantnar valley near Desu		Shrubs, upto 2-3 m; stems glabrous, terete to subsulcate, yellowish; spines yellow-brown, 3-fid. Leaves 3-6 x 1-1.8 cm, narrowly obovate, apex acute to sub-acuminate, margins 15-25 spinose. Racemes 8-10 flowered; outer sepals 5.5x3.5 mm, ovate, acute; inner sepals 6-7x5.5-6 mm, obovate; petals 4.5x4 mm, broadly elliptic; glands elliptic; stamens 4 mm. Berries oblong-ellipsoid.
22	<i>Berberis lambertii</i> Parker	BERBERIDACEAE	Vulnerable or Endangered	Uttar Pradesh (Kumaon). Endemic		Shrubs, ca 1.5 m high. Stems glabrous, angled and finely sulcate, pale yellow; spines slender, 1-3 fid. Leaves 12-28 x 2.7 mm, oblanceolate, sessile, entire, revolute, mucronate. Inflorescence pseudoumbellate or subracemose, 4-7 flowered, 2.5-7 cm long; pedicels stout, 5-15 mm long. Ovules 3-6. Berries red, oblong-ovoid, estylose.
23	<i>Berberis osmastonii</i> Dunn	BERBERIDACEAE	Rare	Uttar Pradesh, Garhwal, in restricted localities. Endemic		Subprostrate shrubs. Stems terete or subterete; mature shoots yellow. Spines 3-fid, slender, 1-3 cm. Leaves 10-20 X 2-3 mm, linear-oblong or very narrowly elliptic, margins entire, revolute. Flowers solitary. Outer sepals 3.5 x 1 mm, oblong-lanceolate; inner sepals 7x3.5 mm, narrowly obovate. Petals 6 x 2.5 mm, entire; glands orbicular; stamens 5 mm, produced, apiculate. Berries ovoid, stylose.

24	<i>Arenaria curvifolia</i> Majumdar	CARYOPHYLLACEAE	Endangered	Garhwal Himalaya, Uttar Pradesh. Endemic	Herbs, 30-60 cm tall, branching at upper nodes. Stem cylindrical, minutely puberulent. Leaves linear, subulate or linear-lanceolate, acuminate, scabro-puberulent at base, 25-55 X 1-3 mm, usually curved. Flowers few, in terminal cymes, pedicels upto 32 mm long, bracts 4-6 mm long, foliaceous. Sepals 5, glabrous, ovate-lanceolate, 8-10 mm long. Petals 5, oblong, entire, 5-6 mm long, obtuse. Stamens 4-6 mm long, anthers elliptic. Ovary globose, 1-2 mm in diam., styles 3. Capsules obovate, 4-5 mm long, 6-valved. Seeds ovate-oblong, flat, 3 mm long, rough.
25	<i>Arenaria ferruginea</i> Duthie ex Williams	CARYOPHYLLACEAE	Endangered	Kumaon Himalaya, Uttar Pradesh. Endemic	Laxly caespitose herbs. Stems much branched, pubescent, angular below, branches slender. Leaves linear-subulate, rigid, sometimes recurved, acuminate, 5-9 X 1-1.5 mm. Bracts similar to leaves but smaller. Sepals 5, thick, hard, lanceolate, acuminate, one nerved, broadly scarios margined, 5-6 mm long. Petals ovate-lanceolate, acute, clawed, ca 4 mm long. Stamens ca 4 mm, glandular at base. Style 3 mm. Ovary 1.5 mm in diam., ovoid. Capsule ca 3.8 mm long, 6 valved. Seeds few, flat, pale yellow:
26	<i>Arenaria thangoensis</i> Smith	CARYOPHYLLACEAE	Vulnerable	Thango (4200 m) and Chugya (4500 m) in Sikkim. Endemic.	Small delicate herbs, 2-3 cm tall, viscous pubescent, branched. Stems with whitish to brownish hairs in a line. Leaves 3-4 mm long, broadly lanceolate, 1-nerved, with ciliate margins. Flowers few in cymes, pedicels 3-4 mm long, divaricate, hairy; sepals 5, broadly lanceolate, 1.5-3 mm long, hairy. Petals absent. Stamens 5, 1.2-1.5 mm long; styles 2; ovary 1 mm long. Capsule 4-valved, 3 mm long. Seeds few, subglobose, 0.6-0.8mm in diam.

27	<i>Carex munroi</i> Clarke	CYPERACEAE	Indeterminate	Himachal Pradesh, Kinnaur. Endemic.		Stems upto 90 cm high, gracile. Leaves shorter than the stem, flat, 3 mm broad. Spikelets 5-6, terminal male with one utricle at base, laterals female, cylindric, 1.5-2.5 cm long, lax-flowered, lowest remote on very long peduncle, female glumes ovate, acute, rarely mucronate, brown, dorsally 3-nerved. Utricles ellipsoid, trigonous, membranaceous, 2.5 mm long, pale, obsolete nerved; beak conic, smooth, bidentate. Stigmas 3.
28	<i>Carex repanda</i> Clarke	CYPERACEAE	Extinct	Endemic to Meghalaya; first collected by J. D. Hooker & T. Thomson from Cherrapunji in 1850. Subsequently several collections were made by C. B. Clarke from Shillong, the last being in 1869.	Presumed Extinct due to forest degradation	Perennial herbs, ca 50 cm high. Rhizome creeping. Stems trigonous. Leaves scattered all along and much exceeding the stem, 2.5-5.0 mm broad, lower sheaths splitting fibrously. Panicles pyramidal, ca 4 cm long; rachis hispidulous. Spikelets androgynous, 6-9 mm long, divaricate; cladophylls utriculiform; male part 2.5-4.0 mm long; glumes ca 3 mm long, aristate, stramineous with pale brown streaks; female part 3-5 mm long; glumes 2.5-3.0 mm long, awned, stramineous with pale brown streaks. Style swollen to the base; stigmas 3. Utricles slightly inflated, trigonous, 3.0 x 0.7 mm, gradually narrowed into a beak, many-nerved, yellowish green; beak ca 1.2 mm long, smooth or hispidulous, straight or curved. Nuts narrowly obovoid, ca 2 mm long.
29	<i>Microschoenus duthiei</i> Clarke	CYPERACEAE	Indeterminate	Uttar Pradesh, Tehri Garhwal, Tehri, Rhudughera, 4572-4876 m. Monotypic and endemic.		Perennial, 2.5-3.0 cm high. Stems with nodes. Inflorescence of 1-3 approximated spikelets. Glumes 6, imbricate on all sides, sub-similar. Hypogynous bristles 2, minute, rudimentary. Style linear-cylindric, smooth, continuous with pistil, stigmas 3. Nuts ellipsoid, trigonous, smooth.

30	<i>Ixonanthes khasiana</i> Hook. f.	IXONANTHACEAE	Vulnerable	Meghalaya (Syrengam, Khasia & Jaintea Hills); Assam (Bhutan hill, Cachar). Endemic.	Vulnerable, due to habitat loss.	Trees <i>ca</i> 40 m high, <i>ca</i> 80 cm in diam.; fluted at base. Leaves 7.0-13.0 2.5-5.0 cm, elliptic-lanceolate to oblong, glabrous, membranous, obtusely acuminate at apex, narrowed at base, decurrent into a short petiole; secondary nerves 6-9 on either half with many intermediate nerves; petiole 0.6-1.8 cm long, glabrous. Peduncles slender, 4.0-10.5 cm long or obscurely winged; pedicels 0.3-0.8 cm long. Flowers <i>ca</i> 5 mm across. Fruits 3.0-4.0 X 1.5 cm, oblong, capsular, 5-valved. Seeds winged.
31	<i>Eremurus himalaicus</i> Baker	LILIACEAE	Rare	Jammu and Kashmir, Himachal Pradesh. Endemic to Western Himalaya.	Rare, due to destruction of its habitats	Stately, scapose, perennial, glabrous, 80-150 cm tall herbs; rootstock thick. Leaves radical, flat, 30-70 cm long. Racemes dense, 30-60 cm long. Flowers white, 2-3 cm across, segments oblong, equalling the stamens. Capsules 1-1.5 cm. Seeds triquetrous.
32	<i>Lilium macklineae</i> Sealy	LILIACEAE	Endangered	Manipur, India. Endemic	The frequent visits of tourists during its flowering time and uprooting of plants resulted in fast depletion of its population in wild. But the timely action taken by the Forest Department of Manipur helped to protect the plants.	Slender bulbous herbs, <i>ca</i> 1 m tall ; bulbs underground, <i>ca</i> 5 cm across, pale brownish. Leaves linear-elliptic, green. Flowers 1-2, terminal, pinkish-white, <i>ca</i> 6 cm across. Capsule trilobed, ovoid, green, <i>ca</i> 3 cm long.
33	<i>Michelia punduana</i> Hook. f. et. Thoms.	MAGNOLIACEAE	Rare	Reported from Meghalaya and Nagaland. The specimen collected from (Nagaland by Boris is in vegetative state and needs further critical study.	Cause of its decline is due to exploration of the trees for timber.	A medium sized tree, young parts reddish, silky, soon becoming glabrous, Leaves <i>ca</i> 10-15 x 4.5-5.2 cm, base acute or obtuse, petiole <i>ca</i> 1.5-2.3 cm. Flowers ,white axillary, solitary, <i>ca</i> 3.5-4 cm across, perianth segments 9, obovate, outer obtuse, inner acute. Stamens indefinite, shorter than gynoecium. Ovary densely pubescent, on stalked gynophore. Fruit a follicle, woody, obovoid, sessile with many reddish-brown seeds. Previous year's fruits remain attached to the plants for a long time.

34	<i>Anoectocbilus tetraptems</i> Hook. f.	ORCHIDACEAE	Vulnerable possibly endangered	or	Endemic to the State of Manipur in India at 800 m.		Herbs, plants 15-20 cm, high; leaves ovate, acute-acuminate, 4-5 cm long, ; velvety and run over with 5 clear nerves; scape 5 cm long, 34 flowered, hairy and bearing 2-3 large elongate-acuminate sheaths; flowers 2 cm across, hairy on the outside; floral bracts lanceolate, equal to or longer than ovary; sepals broadly ovate, acuminate; petals obliquely lanceolate; both pubescent externally and ciliate at the tips; lip 12 mm long, pure white, produced into an arched claw which ends in divaricate apical lobes giving the flowers a peculiar appearance; column with broad auricles in front terminating in a 2-fid membrane overhanging the mouth of the very short conical obtuse spur; anther lanceolate, acuminate.
35	<i>Aphyllorchis gollani</i> Duthie	ORCHIDACEAE	Endangered Possibly Extinct	or	Tehri-Garhwal, Uttar Pradesh. Endemic	It appears to be gravely endangered due to habitat destruction.	Terrestrial leafless herbs with thick fleshy roots. Scapes 40-50 cm high, erect, stout, with many tubular sheaths. Racemes ca 10 cm long. Flowers 8-10, crowded, ca 3 cm long; floral bracts longer than the clavate ovary , elliptic-lanceolate, 5- 7 nerved; sepals ovate-lanceolate; petals shorter than sepals, lanceolate, acuminate; pale green with purple vein; lip pale yellowish-green, attached to the base of column. Column 1.2 cm long, stout curved. Anther 2-celled. Pollinia ovate-oblong.
36	<i>Archineottia microglottis</i> (Duthie) Chen	ORCHIDACEAE	Rare		Garhwal, Uttar Pradesh in the alt. of 1800-2000 m. Endemic.	The plant has become rare due to degradation of natural forests in the region.	Terrestrial, erect, leafless, 20-30 cm high herbs. Roots pale-yellowish-brown, cylindrical, thick. Stem pale-yellow or white with 2-4 loose sheaths. Racemes 10-20 cm long, rachis, bracts and pedicels glandular-pubescent. Flowers crowded, ca 7 mm across, pale-green, pedicel slightly longer than the ovary ; floral bracts equalling or exceeding pedicel oblong, obtuse; sepals 4 mm long, sparsely clothed with hairs; petals as long as sepals, linearspathulate, margins reflexed; lip erect, linear-oblong. Column erect, shorter than petals, rostellum prominent. Pollinia 2, obliquely ovate-oblong. Capsule obovate, sparsely hairy.

37	<i>Coelogyne treutleri</i> Hook. f.	ORCHIDACEAE	Possibly Extinct	Sikkim Himalaya. Endemic.		Rhizome creeping, slender. Pseudobulbs distant, small, ovoid, curved, 2-leaved. Leaves sessile, small, elliptic-lanceolate. Inflorescence 1-flowered. Flowers <i>ca</i> 3.5 cm across. Sepals lanceolate, acuminate. Petals linear. Labellum 3-lobed, lateral lobes oblong, narrow, midlobe large, orbicular, with a broad cuneate base, obtusely 3-lobed at apex, lamellae 3 on the hypochile
38	<i>Cymbidium eburneum</i> Lindl.	ORCHIDACEAE	Vulnerable	Arunachal Pradesh, Manipur, Meghalaya, Nagaland, Sikkim, Himalaya; Nepal. Endemic to Eastern Himalayas and N.E. India.	Due to over-exploitation and habitat destruction	Pseudobulbs short, many leaved. Scape shorter than leaves, erect, 1 to 3 flowered. Flowers 7-10 cm across, with spreading sepals and petals. Lip is 3-lobed, with pubescent, golden-yellow keels.
39	<i>Cymbidium hookerianum</i> Reichb. f.	ORCHIDACEAE	Vulnerable	Kumaon, Sikkim, Arunachal Pradesh; Nepal and Bhutan	The species is threatened due to over-exploitation and habitat destruction	Pseudobulbs about 8 cm long with linear-oblong leaves measuring upto 60 cm. Inflorescence 60-120 cm long, arching, bearing 10-20 flowers of 10 cm across each. Sepals and petals spreading, apple-green; lip three-lobed, white tinged, yellow with purple spots towards the margin and in the centre.
40	<i>Cypripedium elegans</i> Reichb. f.	ORCHIDACEAE	Rare	Uttar Pradesh (Garhwal), Sikkim, Nepal; Bhutan; S. E. Tibet, in the alt. of 3300-4200 m.	Becoming rare due to habitat destruction and over-grazing in the high altitude region	Herbs 10.0-30.0 cm high, pubescent; leaves opposite and almost orbicular or ovate, <i>ca</i> 5.0 cm across. Floral bracts <i>ca</i> 3.0 cm long, ovate lanceolate. Flowers solitary, brownish, with darker lines, 1.0-2.0 cm across; dorsal sepal narrowly ovate, lateral pair united under lip; petals lanceolate, concave, spreading; lip shorter than sepals, depressed. Column short; anthers 2, globose.

41	<i>Cypripedium himalaicum</i> Rolfe	ORCHIDACEAE	Rare	India: Uttar Pradesh (Garhwal, Kumaon), Sikkim; Nepal; Bhutan; S. E. Tibet; at 3000-4300 m alt.		Terrestrial, 20-40 cm high; stem clothed with 3-4 loose tubular acute sheaths. Leaves usually 3, upto 8.5 cm long, ovate-elliptic or oblong. Peduncle pubescent. Flowers purplish-red; floral bracts longer than flowers; dorsal sepals broadly ovate, lateral pair narrower, connate; petals spreading, longer than dorsal sepal; lip sub-globose, much inflated, many-nerved. Column short; anthers 2, globose, hidden under a large staminode.
42	<i>Didickea cunninghamii</i> King et Prain ex King et Pantling	ORCHIDACEAE	Endangered	Sikkim (Lachen Valley), Uttar Pradesh (Garhwal), in the alt. of ca 4,000 m. Endemic to the Himalayas		Pseudobulbs ca 1.0 cm long, with a solitary leaf, leaf ca 4.0 X 2.5 cm, broadly ovate, petiole 1.5 cm long, channelled. Inflorescence erect, 12-22 cm long. Flowers ca 2 mm long; sepals and petals oblong, blunt, spur very short, pointed. Column half as long as the , sepals and lip, wingless. Anther terminal, 2-celled, convex, rather broad. Pollinia 4, free waxy, and without appendages, unequal in size, obovoid.
43	<i>Diplomeris hirsuta</i> (Lindl.) Lindl.	ORCHIDACEAE	Vulnerable	Himalaya: Uttar Pradesh (Kumaon), West Bengal (Darjeeling), Arunachal Pradesh (Kameng); Nepal, Bhutan.	Vulnerable and likely to disappear soon due to landslides, and habitat encroachment	Terrestrial, small herbs with globose underground tubers. Leaves solitary, radical, pendulous, 5.5-8.5 X 1.0-3.0 cm, acute at apex, cordate at base with stiff hairs. Flowers white, usually solitary, ca 2.5 cm across; floral bracts pubescent, ovate, acute; sepals ovate-oblong; petals orbicular, reniform; lip broad, emarginate, spur ca 4.5 cm long, slender. Column short.
44	<i>Diplomeris pulchella</i> D. Don	ORCHIDACEAE	Vulnerable	Cherrapunjee in Khasi Hills, Balphagram in Garo Hills, of Meghalaya and Tirap District of Arunachal Pradesh.		Terrestrial herbs. Roots tuberous. Stems slender. Leaves 1 or 2, or linear lanceolate. Scape arising from middle of the leaves, 1-2-flowered. Flowers large, white with a long spur.

45	<i>Eria occidentalis</i> Seid.	ORCHIDACEAE	Rare	Endemic to Kumaon in Uttar Pradesh, at ca 1550 m altitude.		Epiphytes, pseudobulbs clustered, narrow-conical, 3-4 cm long, surrounded by large sheaths when young, each 2-6 leaved. Leaves 8-10 cm long, 10-12 mm broad at middle. Inflorescence erect, sub-terminal, from young pseudobulbs, often 2 together, scape about 2.5 cm long, rachis ca 3.0 cm, thinly stellate hairy, 7-10-flowered. Floral bracts ca 5 mm long; pedicels ca 5 mm long. Sepals and petals ca 4 mm long.
46	<i>Flickingeria hesperis</i> Seid.	ORCHIDACEAE	Endangered	Kumaon, Uttar Pradesh. Endemic		Epiphytes, stems 30-60 cm high. Pseudobulbs 2.5-4.0 cm long. Leaves 8-11 X 1.5-2.0 cm, minutely bilobulate at apex. Inflorescence one-flowered. Flowers small; dorsal sepal ca 1.0 cm long; lateral sepals oblique, triangular; petals linear-lanceolate; midlobe of lip narrow, transversely elliptical on a short neck.
47	<i>Paphiopedilum insigne</i> (Wall. ex Lindl.) Pfitz.	ORCHIDACEAE	Vulnerable	In India the species occurs only in the Khasi Hills, Meghalaya. Also reported from Sylhet (Bangladesh) and Nepal.	Become very rare due to large scale collections of its natural populations and destruction of its distribution localities.	Terrestrial clump forming herbs. Stems short. Leaves linear, ligulate, green, 10-25 cm long, ca 3 cm broad. Scapes slender, 10 -15 cm long, purplish pubescent, 1-flowered, rarely 2-flowered. Bracts oblong, 3 - 4 cm long, light green, as long as the ovary. Flowers spreading, upto 12 cm across; dorsal sepal orbicular-ovate, ca 5 x 3.5 cm, white and undulate along the margins, irregularly brown-purple dotted in the centre; lateral sepals smaller, light greenish or purplish-white; petals linear-oblong, spreading, ca 5 mm long, yellowish-green or greenish-white with purple veins, margins undulate; lip slipper-like, ca 5 cm long, 3-lobed, yellowish-green with br,?wnish shade or greenish-purple, shiny.

48	<i>Paphiopedilum venustum</i> (Wall. ex Sims.) Pfitz.	ORCHIDACEAE	Vulnerable	Meghalaya, Sikkim; Bangladesh.	It is fast depleting in the wild due to its habitat destruction and overcollection of plants	This species is very distinct even in vegetative condition due to its variegated leaves. Leaves few, elliptic-oblong, acute or acutely bifid, mottled with dark green above. Scape usually 1-flowered. Flowers large, greenish-white with dark green veins; dorsal sepal erect, broadly ovate, ciliate; lateral sepals connate, oblanceolate, ciliate; lip greenish-white, reticulate.
49	<i>Paphiopedilum wardii</i> Summerh	ORCHIDACEAE	Endangered	Lohit District of Arunachal Pradesh. Endemic	Much of the Arunachal Pradesh is affected due to jhumming and consequent degradation of habitats	Terrestrial. Leaves oblong-elliptic, acute at apex. Scape 1-flowered. Flowers medium-sized; dorsal sepal ovate, pale greenish with dark green lines, margin ciliate; lip green with reddish spots.
50	<i>Pleione lagenaria</i> Lindl.	ORCHIDACEAE	Presumed Extinct	Meghalaya, N. E. India. Endemic		Epiphytes, or sometimes epiliths. Pseudobulbs ca 2.5 cm long, somewhat bottle-shaped, green-mottled with blackish-brown speckles; leaves oblanceolate, ca 20 cm long. Flowers rose coloured; lip oblong, emarginate, rose coloured outside, purple with pal purple streaks and blotches inside, margins white.
51	<i>Renanthera imschootiana</i> Rolfe	ORCHIDACEAE	Endangered	In India the species occurs in the hills of Manipur, Nagaland and Mizoram; extends into Burma and S. E. Asia.	due to indiscriminate collection of its plants and loss of its habitats.	Epiphytes; stems long, semi-erect, upto 90 cm long, covered with imbricating sheaths; leaves short, 8-10 x 1.5-2 cm, oblong. Inflorescence ca 30 cm long, branched, 15-30 flowered. Flowers bright red, ca 5 cm long; dorsal sepal linear-lanceolate, ca 20 X 4 mm, lateral sepals diverging, 25-30 X 15-20 mm, margins undulate, elliptic-ovate, clawed; petals spatulate, rounded, ca 14 x 2 mm, orange coloured with reddish spots; lip small, ca 5 mm long, 3-lobed with a short spur, bright red.

52	<i>Zeuxine pulchra</i> King et Pantl.	ORCHIDACEAE	Endangered	India Lachung Valley in North Sikkim at 2,500 m and Khasia Hills in Meghalaya at ca 2000 m: Only two specimens were collected by King and Pantling from Lachung, Sikkim, in 1898. Thereafter, it was also collected in one instance from Khasia Hills.in 1974.	Slight alteration, degradation, clearing of forests, would bring the plants easily to extinction, as they are not adaptable or hardy like most of the epiphytic species of orchids.	Small terrestrial herbs, hardly exceeding 15 cm; leaves 3-4, 2-2.5 cm X 1.5-2 cm., crowded ovate, coriaceous and blackish to brownish-purple on the surface with a distinct white mid-rib. Spike with a peduncle of ca 7.5 cm, covered with white hairs, 2-3-flowered. Flowers ca 7-8 mm long, pale brown, the apical lobes of lip divergent, white in colour.
53	<i>Pittosporum eriocarpum</i> Royle	PITTOSPORACEAE	Indeterminate	India: endemic to Garhwal-Kumaon Himalayan region. As from the literature and herbarium records, the species was frequently collected till 1963 from Dehradun, Musoorie and Sahastradhara, (type locality). But recent collectors could not trace the plant which indicates either the plant has become extremely scarce or is left in very small pockets which need thorough combing.		Shrubs or small trees, branches densely tomentose, leaves broadly obovate- oblong or oblanceolate-oblong, 6-18 x 3-5 (9) cm, apex acute to acuminate, base cuneate, margins entire, under surface densely brownish tomentose; petioles 15-20 mm long, tomentose. Sepals triangular, 2x Imm, pilose. Petals oblong, 9-10x2.2,5 mm. Filaments slender, 5 mm long, anthers 2-2.5 mm long. Ovary 2 mm long, ovoid, densely tomentose; style 3 mm long, stigma capitate, papillose. Capsules 12-15 mm in diam., 2-valved, densely tomentose particularly when young. Seeds many, blackish-red.

54	<i>Deyeuxia simlensis</i> Bor	POACEAE	Presumed Extinct	Known from a single locality near Simla in Himachal Pradesh.		Perennial, stout grass, clumps upto 150 cm high, terete, glabrous, unbranched, erect and covered at the base with the remains of old sheaths. Leaf blades very narrow, upto 30 cm long, rough on both the sides, margins scabrid, midrib prominent, sheaths very long, somewhat rough to glabrous, striate. Ligule extraordinarily long, membranous, lacerate at the top, upto 2.5 cm long. Panicles upto 23 cm long, very lax, branches in whorls, rough, capillary, shortly stalked; branchlets capillary, scabrid. Spikelets lanceolate, numerous, crowded on short, scabrid, pedicels. Lower glume 4 mm long, lanceolate, 1-nerved, rough on the back, scabrid on the keel. Upper glume 4.5 mm long, lanceolate, recurved at the apex, closely 3-nerved, somewhat hyaline on the margins, slightly rough on the back, scabrid on the keel. Lemma 3.5 mm, truncate at the top, faintly 5-nerved, awned from just above the base; callus hairs short, upto 1.5 mm long; awn 6 mm long, exerted, straight. Palea 3 mm long, hyaline; rachilla produced, penicillately ciliate; hairs 1-1.5 mm long. Stamens 3, anthers 2 mm long.
55	<i>Sapria himalayana</i> Griff.	RAFFLESIACEAE	Rare	Arunachal Pradesh, Manipur and Meghalaya. It is recorded from Namdapha Wildlife Sanctuary as rare.	Destruction of its habitats is the main threat factor for its decline.	A dioecious, fleshy root parasite with globose buds; bracts white or pink, surrounding the base of flowers. Flowers foetid, ca 3.5-16 cm across; perianth tube, hemispheric and solid below, cupular above and marked with 20 radiating ridges. Anthers. ca 20, sessile, in a ring under the disk, extrorse. Ovary with anatropous ovules and papillose stigmas. Fruit globose, crowned with the perianth.

56	<i>Aconitum deinorrhizom</i> Stapf	RANUNCULACEAE	Vulnerable	Jammu & Kashmir, Himachal Pradesh; Nepal; Bhutan. Endemic to the Himalayas.	Due to excessive collection of roots for medicinal uses	Tall, erect herb with paired tuberous roots. Stem few feet high, straight, simple, terete, finely pubescent in the upper part. Leaves 10-12, scattered, upper leaves sparingly hairy; petiole slender, 5-7 cm long, dilated at the base; blade reniform or ovate-reniform with, absent a very wide sinus or truncate base, 5-partite almost to the base, lobes deeply lacinate. Inflorescence racemose, simple or often with additional branches, 30-40 cm long, lax, greyish-crispo-pubescent, lowest bract leaf-like, rest are much reduced, coarsely dentate. Sepals blue, crispo-puberulous, uppermost helmet-shaped, depressed, 17-22 X 7 mm, produced, into a short beak; laterals 14-18 mm long; lower 10 mm long, oblong, obtuse, deflexed. Nectaries hispidulous all over. Carpels 3, oblong, adpressedly greyish-pubescent, style long. Seeds obconic, 3 mm long, terete with numerous transverse lamellae.
57	<i>Aconitum ferox</i> Wall. ex Seringe	RANUNCULACEAE	Vulnerable	Himachal Pradesh to Sikkim. Endemic.	Due to excessive collection for medicinal uses	Erect, puberulous herbs with paired, tuberous roots. Leaves scattered, distant, glabrous or the uppermost very sparingly hairy, 7-15 cm, lobes cuneate-ovate, incised; petiole slender, upto 25 cm long, dilated at the base. Racemes 15-30 cm long, simple or sparingly branched below, tomentose; bracts pinnatifid; bractioles linear. Flowers large, pale blue. Helmet about twice as long as high. Carpels five, tomentose, gradually passing into style. Follicles oblong, 15-20 x 4-5 mm, loosely subtomentose, conspicuously reticulate. Seeds obovoid to obpyramidal, 2.5-3 mm long, winged along the raphe, transversely lamellate on the faces, lamellae undulate.
58	<i>Clematis apiculata</i> Hook. f. et Thorns.	RANUNCULACEAE	Endangered	Endemic to Khasi Hills in Meghalaya, in the North-eastern region of the country. It was first collected by Griffith in 1837 from Nongkhlaw; Hooker and Thomson collected it in 1850 from Cherrapunji and later in 1932 P. C. Kanjilal located this species in the Mamloo forest, Khasi Hills. It could not be collected after 1932.	Causes for its decline are the clearance of forests for the development of factories and agricultural purposes.	A slender woody climber; branches with more than 6 ribs. Leaves opposite, 3-foliolate, sometimes simple, hairy on both surfaces. Leaflets 2.6-7 x 0.8-4.6 cm, usually toothed at margin, petiole ca 2.6-6.5 cm long. Flowers in axillary fascicles with naked pedicels, tepals ca 4-7 X 1-3 mm, oblong, tomentose outside. Stamens glabrous, connective produced into a minute mucronule beyond the anther. Achene broad-ovate or obovate, hairy.

59	<i>Cotoneaster simonsii</i> Hort. ex Baker	ROSACEAE	Indeterminate	Endemic in Sikkim Himalaya. The place of origin of the seeds from which the plants were raised for Baker's tab. 55(1) is not "Khasia mountains" (1), but Sikkim Himalaya (3).		Erect shrub, deciduous or semievergreen, 3-6 m high, slender branches strigose pubescent and persisting to 2-3 years. Leaves elliptic-obovate, cuneate at the base, narrowing above the middle to a mucronate apex, dark green above and pubescent beneath when young, pale green beneath and sparsely strigose, chiefly on the veins and margin, lamina 25 X 15 mm, subcoriaceous; petiole 2-4 mm long, pubescent. Flowers 2-4 in short cymes; calyx tube appressed pubescent at the upper half only; sepals triangular; petals upright, white with red markings. Fruit short, turbinate, ca 8 mm long, shortly ellipsoidal or obovoid, with 3-4 nutlets per fruit. Ripe drupe scarlet red and edible.
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60	<i>Ophiorrhiza wattii</i> Fischer	RUBIACEAE	Endangered	Meghalaya, Nagaland and Manipur.	Its habitats in many localities have undergone changes due to developmental activities and extensive jhumming.	Suffruticose erect glabrous herb. Leaves opposite, 6 -16.5 x 2.4-4.5 cm, elliptic or elliptic-lanceolate, acuminate at apex, tapering to the base, dark green above, pale below, scattered hairy on both the surfaces; midrib impressed above; lateral nerves 9-12 pairs, arched, joining above along the margin; petioles 1- 3.5 cm long, slender; stipules early deciduous, minute, linear. Inflorescence a terminal corymbose cyme, 2-4 cm across, puberulous; peduncle 1.2- 2.5 cm long, elongating upto 6 cm on fruting, puberulous. Flowers 13-15 mm long, white; bracts and bracteoles similar, persistent, 4-14 mm long, linear, puberulous. Calyx lobes 5, 1.25-2x0.2-0.25 mm, ensiform or linear, acute, puberulous. Corolla 11.7-13.4 mm long, narrowly funnel shaped, glabrous outside, villous below the middle within; lobes 5, broadly ovate-oblong, acute, shortly recurved, keeled at back, glabrous. Stamens 5, adnate to the middle of corolla tube, inserted; filaments 3-4 mm long; anthers 2.75-3.5 mm long, linear- oblong. Ovary inferior, obovoid; disc 1-2 mm high; style 3-4 mm long, glabrous; stigma bifid glabrous. Capsule 2-2.5 X 5.7 mm, 2-lobed, puberulous, locules ovate-oblong with straight tips. Seeds minute, irregularly angular, glabrous, brown, testa areolate with tubercled thick wall.
61	<i>Picrorhiza kurrooa</i> Royle ex Benth.	SCROPHULARIACEAE	Vulnerable	Jammu and Kashmir to Sikkim.	Becoming scarce due to over-exploitation for its medicinal properties	Rootstock as thick as little finger, covered with withered leaf-bases. Leaves 5-10 cm, coriaceous, tip rounded, base narrowed into a winged sheathing petiole. Scape stout, ascending, longer than the leaves, with or without bracts below the inflorescence. Spike 5-10 cm long, obtuse, many flowered, sub-hirsute; bracts oblong or lanceolate, as long as calyx. Sepals 5, lanceolate, 4-7 mm long, ciliate. Corolla 5-8 mm long; lobes ovate, acuminate, ciliate. Capsule 1-1.5 cm long, ovoid, turgid, acute.
62	<i>Sterculia khasiana</i> Debbarman	STERCULIACEAE	Presumed Extinct	Endemic to the Khasi hills in Meghalaya. Griffith (<i>s.n.</i>) collected it from the Khasi hills. Later, Rutton (1873) and Clarke (1877) could also collect this species from the Khasi hills. It has not been collected after that.	Causes for its decline and possible extinction are the destruction of its natural habitats.	A medium sized tree, young shoots and inflorescence ferruginous tomentose. Leaves elliptic or obovate, lanceolate, entire, ca 8-17.5 X 4-5.6 cm long, narrowed towards the base and shortly petiolate. Racemes axillary or terminal. Flowers bracteate, pedicellate, apetalous. Pedicels 6-12 mm long. Calyx lobes 5, puberulous inside, linear-lanceolate, 3-nerved. Staminal column ca 3-4 mm long, thick and reflexed.

63	<i>Adinandra griffithii</i> Dyer	TERNSTROEMACEAE	Endangered.	Endemic to Meghalaya. It was reported by Dyer in 1874 based on Griffith's collection from the Khasi hills. It has not been collected since 1938	The development of Mamloo cement factory near Cherrapunji threatens its natural habitat and is resulting in habitat loss.	A small tree, bark warty. Leaves elliptic-lanceolate to oblong-lanceolate at base, bluntly acute to acuminate at apex, entire with recurved margins; lateral nerves <i>ca</i> 20, obscure. Flowers axillary, solitary or paired on <i>ca</i> 2.2-3 cm long pedicels, white fragrant. Sepals 5, persistent, <i>ca</i> 1.3 cm long, suborbicular to orbicular. Stamens many adnate with petals. Ovary 5-celled, glabrous, style 5-fid, jointed. Fruit a berry, ovoid, many seeded.
64	<i>Dendroglossa minutula</i> (Fee) Copel.	POLYPODIACEAE	Endangered.	Endemic to Khasia Hills, Meghalaya, Eastern India (4). Fee (5) described this species from Khasia Hills. Last collection was made by C. B. Clarke in 1871 according to herbarium materials available in CAL.	Causes of threat are clearing of forests and destruction of its habitats.	Small plants, rhizome very slender; scales lanceolate; stipes slender, distant. Fronds dimorphous. Sterile fronds up to 5 cm long, membranaceous, stipe 1-4 cm long, lamina oblong or broadly lanceolate, 2-5.5 cm long, 6-10 mm broad at middle, base tapering, apex obtuse, margin entire, costa distinct, costules indistinct, veins reticulate forming areola which contain free included veinlets, areola small towards margin. Fertile frond 9-12 cm long, stipe slender, wiry; lamina linear, 3.5 cm long, 3-4 mm broad at middle.
65	<i>Selaginella adunca</i> A. Br. ex Hieron.	SELAGINELLACEAE	Endangered	Endemic to North-West Himalayas	Cause for its decline is endemism to North-West Himalayas and habitat destruction in the region.	Stems 15-25 cm, decumbent, terete, densely matted, bright red to stramineous red, simple in the basal region, copiously branched above, branches decomposed, flagellate. Rhizophores long, confined to the basal half. Leaves obscurely heteromorphic, continuous, usually adpressed to the stem, rigid; lateral leaves oblong, subfalcate, cuspidate, ciliate at the base on proximal side, rest dentate to denticulate, distal side smooth with a strong median nerve and two lateral branches, median leaves small, elliptic, cuspidate, dentate. Strobili quadrangular, 3-5 X 1-2 mm; sporophylls uniform, deltoid, cuspidate, dentate.

66	<i>Areneria thangoensis</i> Smith	CARYOPHYLLACEAE	Vulnerable	Thango (4200 m) and Chugya (4500 m) in Sikkim. Endemic.		Small delicate herbs, 2-3 cm tall, viscous pubescent, branched. Stems with whitish to brownish hairs in a line. Leaves 3-4 mm long, broadly lanceolate, 1-nerved, with ciliate margins. Flowers few in cymes, pedicels 3-4 mm long, divaricate, hairy ; sepals 5, broadly lanceolate, 1.5-3 mm long, hairy. Petals absent. Stamens 5, 1.2-1.5 mm long; styles 2; ovary 1 mm long. Capsule 4-valved, 3 mm long. Seeds few, subglobose, 0.6-0.8mm in diam.
67	<i>Fimbristylis stolonifera</i> Clarke	CYPERACEAE	Rare.	Endemic to north-east India. Earlier collected in nineteenth century from various places in Khasi hills (Meghalaya) by J. D. Hooker and C. B. Clarke, and from Manipur by G. Watt. But now probably confined to Mawphlong (Meghalaya) from where it was last collected by D. M. Verma in 1969.		Slender perennial herbs, 10-60 cm high. Root-stock with 1-3 slender creeping stolons upto 7 cm, hardening into wiry rhizomes. Leaves ligulate, one-half as long as to equalling the stem, 1.5-2.0 mm broad. Anthela lax, simple or compound, 2-3 cm across, usually bearing 4-16 spikelets but sometimes only one spikelet; bracts 2-3, foliaceous, suberect, shorter or equalling the anthela; rays 3-8, longest 1.5-3.5 cm; spikelets solitary, linear-oblong, terete, 5-8 X 2.0-2.5 mm; glumes spiral, broadly ovate, mucicous, 2.8-3.2 mm long, dark blackish-brown with green nerves; stamens 3; anthers 1.5 mm long; stigmas 2, or rarely 3. Nuts stipitate, broadly obovoid, ca 1.0 X 0.8 mm, stramineous-brownish, trabeculate due to the surface cells being arranged in 12-14 rows on each face.
68	<i>Cymbidium whiteae</i> King & Pantling	ORCHIDACEAE	Endangered	India; endemic to Sikkim in North-Eastern Himalayas. This species was: originally discovered in Gangtok at 1700m., by Mrs. Claude White and named after her. The original habitat no longer exists, though it is known to occur sporadically around Rhumtek.		Perennial herb with short pseudobulbs, 5-15 cm long; leaves linear, acuminate, 60-90 cm. X 1.6 cm at the broadest part. Inflorescence from base of pseudobulb, 35- 45 cm long, pendulous, the peduncle covered throughout with scarios oblong-lanceolate, acuminate bracts, 2.5-12.5 cm long. Raceme 15-20 cm, 10-12-flowered. Flowers 4.5 cm long, yellowish-green, flushed with purple and spotted with red; labellum translucent white or pinkish spotted profusely on sides and apex, and bearing two pubescent lamellae near the apices of the lateral lobes. Capsule 4-5 cm long, ellipsoid.

69	<i>Paphiopedilum fairrieanum</i> (Lindl.) Stein	ORCHIDACEAE	Endangered	Endemic to the Eastern Himalayas and is restricted to small pockets in Sikkim, Bhutan and Arunachal Pradesh.	Overcollection of its natural populations, forest fires and grazing have led to the decline of the species in its natural habitats.	Terrestrial clump forming herbs. Leaves 4 - 8, linear-ligulate, apex obtuse or rounded, 9 - 25 x 2.5 - 3.5 cm, dark green above, paler beneath. Peduncles erect, upto 40 cm long, slender, hairy, usually 1-flowered; bracts elliptic, obtuse, 1-4 x 1 cm, whitish, purple-pubescent. Flowers attractive, 6-8 cm across; sepals white, green and purple veined; dorsal sepal elliptic, obtuse, 3.5 - 8 x 3 - 7 cm, ciliate, margins wavy; petals reflexed-decurved, narrowly, oblong, acute, 4- 5 x 1-1.5 cm. margins ciliate, wavy; lip slipper-shaped, shortly apiculate, 2-4x1.4-2.5 cm; staminode elliptic, 3-dentate at apex, ca 9 x 7 mm.
70	<i>Paphiopedilum spicerianum</i> (Reichb.f.) Pfitz.	ORCHIDACEAE	Vulnerable	Reported to occur in Bhutan (1 & 9) but locality possibly overcollected and hence lost. It is endemic to the flanks of the Rivers Barak and Sonai near Silchar in the State of Manipur, at 750-1000 m. It is also reported from Lushai Hills (W. L. Wenger, 224, K.) In Burma, it is reported from the hills west of Tang Hapre, ca 360 m (J. Keenan, 3994, K. I).	Collecting for horticulture in the early sixties has also resulted in the depletion of the natural habitats to some extent	A stemless species with straplike, leathery green leaves, appearing varnished on the upper side and dull greyish-green on the underside. Leaves 3 - 5, linear-lanceolate to linear- oblong, 15 - 30 cm x 2.5 - 4.5 cm, spotted purplish-red at the base, margins crenulate at base. Flowers are borne singly or rarely in twos, on slightly arched stems, 20 - 40 cm long; dorsal sepal orbicular-elliptic, 3.8 x 4.5 cm, pure white with yellowish-green base and a broad purple longitudinal median band, deflexed at the basal margins, pointed at the apex and curved forwards slightly to form a hood-like structure; petals green-spotted and flushed with purple and brown, margins crenulate. Lip 4.5 cm long, slipper shaped, brownish-green and shiny.
71	<i>Paphiopedilum villosum</i> (Lindl.) Stein	ORCHIDACEAE	Vulnerable	In India the species is reported only from Mizoram; also distributed in Burma.	Large scale collection of the species from the wild and habitat loss due to conversion of the forests are the main causative factors that led to the decline of the species.	Terrestrial or epiphytic, clump forming herbs. Sten;ls very short or absent. Leaves upto 25 cm long, ca 5 cm broad, linear, ligulate, green, apex acute or bifid, scape hirsute, 1-flowered. Bract oblong, ca 5 cm long, as long as the ovary. Flowers spreading, ca 15 cm across, dorsal sepal broadly orbicular-ovate, revolute, ca 6 x 4 cm, greenish-white and white along the margins towards apex, brownish-purple and ciliate at base; lateral sepals spreading upto 6 cm long, green; petals brownish-purple; lip slipper shaped, upto 5 cm long, 3-lobed, purplish-brown with light yellow tinge, light pinif veined, smooth, shiny.

72	<i>Pholidota wattii</i> King et Pantl.	ORCHIDACEAE	Rare	Arunachal Pradesh and Assam. Endemic to North-eastern India.		Rhizome creeping, stout. Pseudobulbs narrowly ovoid or fusiform, 2-leaved. Leaves petioled, narrowly-elliptic or oblanceolate, plicate. Inflorescence arising from the young shoot, 10-25 cm long, many-flowered. Flowers 1.5-2 cm across, pale green, becoming straw coloured with age. Sepals spreading, unequal, ovate. Petals linear. Labellum 3-lobed, brown tinged, hypochile deeply saccate, 3-ridged, epichile recurved.
73	<i>Meconopsis latifolia</i> (Prain) Prain	PAPAVERACEAE	Vulnerable	India, confined to Kashmir Himalaya	The species has diminished in the wild partly due to natural causes and partly due to loss of its habitats.	Bristly herbs, 30-100 cm tall, clothed with patent, yellowish-brown or golden, brown bristles of 2-8 mm long. Leaves 8-30 x 2-6 cm long, ovate-lanceolate, sinuate-lobed or deeply incised-serrate, rarely pinnatifid. Petioles 2-10 cm long. Flowers axillary or terminal, forming leafy racemes. Pedicels 1-4 cm long. Sepals 1.0-1.5 cm long, broadly oblong, sparsely, bristly. Petals 4, 2-4 cm long, blue or white, obovate or suborbicular. Stamens numerous, anthers yellowish. Ovary ovoid, bristly; styles 1.5-3.0 mm long. Capsules ellipsoid-oblong, bristly, dehiscent by 4-7 valves, 1.0-1.5 cm long. Seeds 0.1 cm long, sub-reniform. The species is taxonomically intermediate between <i>Meconopsis aculeata</i> Royle and <i>M. sinuata</i> Prain. It is distinguished from <i>M. sinuata</i> in having broader leaves, shorter capsules and more flowered inflorescence. It differs from <i>M. aculeata</i> in having shorter pedicels and less dissected leaves (2).

74	<i>Psychotria aborensis</i> Dunn	RUBIACEAE	Endangered	Restricted to Abor Hills in Arunachal Pradesh	Possible loss of the species due to habitat changes for developmental activities and extensive forest clearings for jhum cultivation in recent years.	Small shrubs, 1.8-2 m high, glabrous. Leaves opposite, petiolate, 17-24 x 6-17 cm, broadly ovate or elliptic, shortly acuminate at apex, slightly incurved at margin, cuneate at base, thinly coriaceous, pale green, glabrous above, brownish-green tomentose beneath; midrib channelled above; lateral nerves 10-14 pairs, subopposite, subparallel, faint above, without domatia, intramarginal nerves conspicuous; petiole 2-5 cm long, stout, tomentose beneath; stipules interpetiolar, 15-20 x 10-12 mm, spatulate to obovate, 2-lobed, acuminate or caudate, pubescent above and at base beneath. Inflorescence terminal, peduncled or subsessile panicle of cymes, 5-7 x 5-6 cm when fruiting; branches 4-5 at a whorl, short, pubescent or puberulous; peduncle 0.5-1.5 cm long, puberulous; bracteoles persistent, 4-6 x 2-4 mm, ovate to lanceolate, acuminate, entire or 2-3-lobed, acute or acuminate, pubescent. Flowers not seen. Calyx 2-2.5 x 2-2.5 mm; hypanthium obovoid, pubescent; calyx lobes 5, 1-2 mm long, linear, pubescent above. Fruits sessile, 8-10 x 2-8 mm, ovoid or ellipsoid-ovoid, crowned with persistent calyx lobes at apex, 2-4 striped, loosely puberulous; pyrenes 2, ellipsoid, acute at both ends, planoconvex, smooth, thin walled; raphides present. Seeds 7-9 X 4-5 mm, ellipsoid, acute at both ends, planoconvex, dorsally slightly ridged, ventrally T-shaped grooved.
75	<i>Lastreopsis wattii</i> (Bedd.) Tagawa	ASPIDIACEAE	Presumed Extinct	Endemic to Manipur, Eastern India. Beddome (1) described this species on Dr. Watt's collection from Kayan, east Manipur. Despite several collection tours in Manipur conducted by Botanical Survey of India, this species has not been found and collected since the original collection.	Due to habitat loss	"Rhizome?; stipes stramineous, 10-12 cm long, clothed with a few light coloured deciduous scales. Frond 30-35 cm long, 5-6 cm wide, tripinnate, broadest in the centre, gradually narrowed towards apex and base, rachis naked, texture subcoriaceous, surface glossy, ultimate segments obovate to lanceolate, sharply acuminate or rarely with a rounded apex, more or less 2-10bed; veins once forked in ultimate segments. Sori apical on short lower veinlets, often furnished with a few deciduous hair-like scales." (2).

76	<i>Alhyrium atratum</i> Bedd.	ATHYRIACEAE	Endangered	Endemic to Manipur, Eastern India. Beddome (1) described this species on Watt's collection n. 6159. Despite several recent collection trips in Manipur conducted by Botanical Survey of India, the species has not been collected.	Due to clearing of forests for shifting cultivation and forest fires	"Rhizome erect, furnished with numerous long stiff, wiry roots, covered with narrow, linear, pale coloured scales. Stipes tufted, 2.5-8 cm long. Fronds 15-30 cm long, 5-10 cm wide, lanceolate, attenuate at both ends, bipinnate, turning quite black on drying, pinnae oblong-acuminate, lower pinnules largest, pinnules dimidiate, being always more or less cut away at the base, more developed on the upper side, cut down 1/3 -t towards the midrib into several lobes which have 2-4 sharp, unequal serratures at the rounded apex; veins forked or pinnate in the lobes. Sori very small, about the centre of the vein; indusia athyroid, fugaceous"(1).
77	<i>Angelica nubigena</i> (Clarke) Mukh, (Heracleum nubigenum Clarke)	APIACEAE	Indeterminate	India; endemic to north-east Sikkim at Chola and Yakla passes, at an altitude of 3800 m.		Stout, erect, branched pubescent herbs, 1-2 m tall. Lower cauline leaves including the petiole 3 partite to ternate-pinnate or ternate, upto 3.5 dm long including the petiole. Leaflets ovate or ovate-lanceolate, 5-10 cm long, 2-3 cm broad, serrate, decurrent. Peduncles stout upto 30 cm long. Bracts 4-12, linear, caducous, to 1 cm long, Rays 30-50, unequal, 3-16 cm long, pubescent, spreading or ascending. Pedicels 15-30, not all bearing mature fruits, unequal, 1-1.5cm long, pubescent. Bracteoles 4-12, linear, to 5 mm long. Flowers not known. Fruits orbicular, 5-8 mm long, 4-6 ml;1 broad, emarginate at both ends, glabrous, dorsal ribs prominent, obtuse, the laterals broadly thill. winged, wings slightly broader than the body. Vittae solitary at the intervals, lacking or fragmentary on the slightly convex commissure.
78	<i>Pimpinella flaccida</i> Clarke	APIACEAE	Indeterminate	India; endemic to Kohima, Nagaland, at about 1780 metres; its report from China is doubtful.	Its distribution areas have undergone considerable degradation due to biotic factors since its type collection.	Erect, flaccid, branched and sparsely leafy herbs. Pilose in younger parts. Leaves triangular-ovate, pinnate with 3-7 broad ovate-triangular to ovate-oblong petiolulate leaflets with acute apices. Umbels terminal and lateral. Bracts and bracteoles lacking. Rays 3 or 4, very slender, subequal, 0.5-2 cm long. Pedicels 3-6 (-10), slender, spreading, 6-8 mm long. Calyx teeth obsolete. Fruit ovoid, to 2 mm in diameter, subterete in c.s., glabrous, ribs filiform, vittae not seen, carpophore bipartite(?).

79	<i>Pternopetalum senil</i> Deb et Dutta	APIACEAE	Rare	India, Tirap district in Arunachal Pradesh. Possibly endemic.	Erect, slender, 30-40 cm tall herbs. Rhizome subterranean, fleshy. Leaves long petioled, ovate, ternate-decompound, leaflets 1-4 cm x 5-15 cm, pinnati-partite, glabrous above, sparsely hispidulous beneath, ciliate at margins. Umbels terminal, long peduncled; bracts absent; rays 20-50, spreading, ascending, unequal, 3.5-6 cm long. Pedicels 2-3, erect, very unequal, almost sessile to 3 mm long. Calyx teeth slightly evident, petals purple. Fruits oblong, slightly compressed laterally, glabrous, ribs filiform, subequal, mericarps subterete in c.s., vittae solitary at the valliculae and 2 on the commissure.
80	<i>Trachycarpus takil</i> Becc.	ARECACEAE	Rare	Mt. Takil, Kumaon, Uttar Pradesh. Endemic.	Stem solitary, inclined, closely covered with leaf-sheath fibres and triangular leaf-base appendages. Leaves palmate; petiole margins crenulate. Inflorescence monoecious, decompound, interfoliar. Male flowers glomerulate with yellow fleshy bracts at base. Fruits reniform.
81	<i>Ceropegia angustifolia</i> Wight	ASCLEPIADACEAE	Vulnerable	In India the species is confined to North-Eastern Hilly region (Meghalaya); also reported from Nepal and Bangladesh. Sporadic collections made in 1931, 1944 and 1968 (ASSAM, CAL) from Khasi and Jaintia hills, Meghalaya, indicate its rarity in India. Its distribution habitats in India have undergone degradation due to jhum cultivation, etc.	Twinner with hairy stem, hairs in 1 or 2 rows. Leaves linear to lanceolate. Cymes few-flowered, pedunculate. Corolla upto 4 cm long; tube 15-29 mm long, base inflated; lobes 8.11 mm long, broad or elliptic-oblong, glabrous. Outer corona of 5 shortly bifid, hairy lobes; inner linear-subspathulate, erect.

82	<i>Ceropegia arnotiana</i> Wight	ASCLEPIADACEAE	Endangered	A South-East Asian species, its occurrence in India is based on the collections of Clarke (44470) and Lobb s.n. (K) from Khasia hills, Meghalaya State. Except for a single sheet bearing Wallich Cat. no. 8142 in vegetative state (CAL), there seems to be no other specimen available elsewhere in India. The species has not been collected from Meghalaya in the recent botanical explorations.		Twiner with- narrowly elliptic-lanceolate, short-petioled leaves. Cymes sessile or short peduncled, few to many-flowered. Corolla 2.7-5.4 cm long; tube 1.2-2.2 cm long, narrowly linear. Outer corona of 5 bifid lobes, inner erect.
83	<i>Ceropegia hookeri</i> Clarke. ex Hook. f.	ASCLEPIADACEAE	Endangered	India (Sikkim); Nepal; Tibet; endemic to Himalayas. An old collection made in 1909 from Zemu valley, Sikkim and another collection, made in 1945 from Tibet are the only ones available in Indian herbaria.		Twiner or decumbent herb with hairy stem, hairs in 1 or 2 rows. Leaves ovate, acuminate, hairy above. Cymes few-flowered; peduncles hairy; pedicels glabrous. Corolla ca 2 cm long, dark purple; tube ca 12 mm long, lower half inflated with a thin ring of hairs in the middle inside; lobes ca 8 mm long, linear-subspatulate. Outer corona entire, hairy; inner linear, erect.
84	<i>Ceropegia lucida</i> Wall.	ASCLEPIADACEAE	Endangered	Its occurrence in India is based on J. D. Hook. et Thomson collection from Khasia hills (Meghalaya), Keenan from Cachar (Assam) (K) and King 2430 (CAL) from banks of the river Ryang, in Sikkim. All these collections were made in the nineteenth century only. Wallich's collection from Bangladesh and King's collection from Sikkim are available at CAL.		Twiners with ovate, oblong or lanceolate leaves and few-flowered cymes. Corolla ca 5 cm long; tube ca 2.5 cm long, inside a ring of hairs at the mouth of the inflated base; lobes ca 2.5 cm long, ciliate within the spatulate apex. Outer corona of 5 bifid, deltoid ciliate lobes; inner erect, linear-clavate.

85	<i>Inula racemosa</i> Hook. f.	ASTERACEAE	Vulnerable	In the hills of Jammu & Kashmir State.	Natural populations of the species are getting depleted due to indiscriminate collections of the plants for its medicinal value and loss of habitats in its distribution range.	A stout herb, 0.5-2.0 m high. leaves are thick and scabrid above, tomentose beneath. Basal leaves are long petioled, elliptic-lanceolate; cauline leaves are almost stem-clasping i.e. 1/2 amplexicaule, oblong. Heads are large, ca 5.0 cm in diam., many, yellow. The fruits are compressed, glabrous, about 5.0 mm long.
86	<i>Saussurea bracteata</i> Decne.	ASTERACEAE	Rare	In India the species occurs in Jammu & Kashmir, Himachal Pradesh and Uttar Pradesh in the high altitudes of 3500-5500 m. It is also reported from Pakistan and Central Asia.		Herbs, 7.5-35.0 cm tall, very stout, scaberulous, simple. Basal leaves 7.0-10.0 x 1.5-2.5 cm, linear-lanceolate or narrowly elliptic, acute, coarsely toothed, narrowed into a short petiole; upper sessile, half, amplexicaule, acuminate. Floral bracts 2.5-5.0 cm long, often as broad and purplish, cymbiform enclosing solitary large sessile sub-silky head. Heads 1.5-2.0 cm across. Peduncles short, stout, densely woolly. Involucral bracts blackish, lanceolate-acuminate. Corolla ca 1.2 cm long. Anther-tails short, woolly. Achenes glabrous. Pappus white. Outer bristles scabrid.

87	<i>Saussurea costus</i> (Falc.) Lipschitz	ASTERACEAE	Endangered	Jammu & Kashmir, Himachal Pradesh (Chamba), Uttar Pradesh (cultivated); Pakistan.	due to indiscriminate collection and loss of its habitat.	Root stout, often upto 60 cm long and 30 cm in thickness; carrot-like, sometimes a number of roots jointed together at the collar zone, greyish to dull brown in colour and possess a characteristic odour which can be smelt from a distance. The plant is robust, perennial, pubescent or hairy, 1.0-2.5 m high, with basal and stem-leaves. Basal leaves with 60-90 cm long, winged 'stalk (petiole) and with a terminal lobe, scaberulous above and glabrous beneath, margin irregularly toothed. Stem-leaves (cauline) clasping the stem (half amplexicaule), with or without a stalk. Flowers in a head which is usually 2.5-5.0 cm in diam., rounded and in terminal clusters of 2-5, dark-purple, stalkless. Bracts surrounding the heads many, egg-lance-shaped, long pointed, rigid, bent back, hairless. Corolla dark blue-purple or almost black. Stamens. free; anther-tails fringed. Fruits (achene) ca 8 mm long, curved, compressed. Pappus hairs brown, all feathery.
88	<i>Rhopalocnemis phalloides</i> Jungh.	BALANOPHORACEAE	rare	In India it occurs in Khasia hills of Meghalaya, Tirap district of Arunachal Pradesh, Sikkim in Eastern Himalayas. It is also reported from Java.	Main causes of rarity are loss of its host plants and suitable ecological niches.	A very stout, dioecious and glabrous root parasite of perennial nature; sheaths at the base of peduncles, ca 1-2.4 em in diameter. Peduncles ca 2-10 cm long, cylindric, pale, brown; the female inflorescence is very large, fleshy ca 25 cm tall and 10-15 cm in circumference, ovoid to oblong, brown to rusty brown, style reflexed. Male flowers with the staminal column ca 1-1.6 cm long, filaments velvety.
89	<i>Berberis apiculata</i> (Ahrendt) Ahrendt	BERBERIDACEAE	Rare. Endemic	Simla, Himachal Pradesh		Shrubs. Stem yellow, subterete. Spines. 3-fid. Leaves upto 23 x 6 mm, narrowly obovate, rounded, mucronate, margins 2-3 spinulose. Inflorescences subumbellate, 5-8-flowered. Prophylls yellow. Outer sepals 5x3 mm, elliptic; inner 8x5.5 mm, obovate. Petals 6.5 x 3.75 mm, entire, base clawed; glands oblanceolate. Stamens 5 mm, connective produced, apiculate. Ovules 5-7, stipitate.

90	<i>Erysimum thomsonii</i> Hook.f.	BRASSICACEAE	Rare	Himachal Pradesh (Kinnaur). Probably Endemic.	Perennial, erect herbs. Petals 2-3 mm broad. Style .2-2.5 mm long, slightly thickened with capitate, sub-bilobed stigma. Siliquae usually elongated, 60-90 x 2 mm, many seeded. Seeds large, 2.5-3 x 1 mm, slightly winged towards the apex.
91	<i>Campanula wattiana</i> Nayar u Babu	CAMPANULACEAE	Rare	India; endemic to Himalaya in Himachal Pradesh and Uttar Pradesh	Perennial, suberect to ascending, pilose to woolly hairy, 13-40 cm tall herbs. leaves crowded above, ovate-elliptic to lanceolate, densely pubescent. Flowers solitary, pedicillate, terminal, corolla blue, subrotate, cleft to 1/2 the length. Capsules ovoid to obconoid, dehiscent through 3 basal pores; 4-0 mm long and as broad.
92	<i>Codonopsis affinis</i> Hook. f. et Thoms.	CAMPANULACEAE	Rare	India; endemic to Darjeeling and Sikkim Himalaya	Twining, branched, glabrous to puberulous herbs. Leaves alternate or opposite, petiolate, ovate to ovate-lanceolate, dentate or subentire, pubescent on the upper surface and villous on the lower surface, 1.2-7.6 x 0.5-4.6 cm. Flowers green with purple or red marks, pedicillate, leaf-opposed to terminal. Corolla broadly cylindrical or campanulate, cleft for less than 1/2 the length, 9-11.5 mm. Capsules subglobose, 8.5-11.5 mm long and 9-12 mm broad.
93	<i>Cyananthus integra</i> Wall. ex Benth.	CAMPANULACEAE	Rare	India; endemic to Kumaon-Tehri Garhwal Himalaya	Perennial, decumbent, 6.5-37 cm tall plants. Leaves alternate, subsessile to petiolate, broadly oblong to elliptic; subentire to crenate or at times recurved at margins, pilose on both the surfaces. Flowers deep blue, sessile to pedicillate. Corolla tubular or infundibular, sparsely pilose at throat, lobed for 1/4-1/3 of the length. Capsules ovoid-conoid or ovoid-campanulate, 14-17.5 mm long and 7.5-9 mm broad.

94	<i>Capparis cinerea</i> Jacobs	CAPPARACEAE	Indeterminate	Confined to North-eastern India in Manipur. Endemic and collected from a single locality.		Shrub, densely fulvous tomentose, armed with straight conical stipular thorns 1-2 mm long; cataphylls common at base. Leaves dull, coriaceous, glabrous, elliptic, 7-10x2.8-3.2 cm, dark green above, yellowish-green below, base obtuse, apex acute to acuminate, lateral nerves 7-8 pairs, puberulous along midrib and nerves. Umbels on stalks 1-2 cm long, axillary, lax and upto 5-flowered. Flowers white, tinged pink; bracts subulate, 1 -2 mm; pedicels 1-2.2 cm long, filiform, puberulous. Sepals elliptic, 6 X 4 mm, ciliate. Petals obovate ±9 x 4 mm, tomentose on both sides. Stamens 30-35, exerted; filaments 2-2.5 cm long. Ovary glabrous, ellipsoid, 1.5 x 0.5 mm, on a glabrous gynophore 1.8-2.5 cm long; style indistinct, placentae 2. Fruits unknown.
95	<i>Silene kumaonensis</i> Williams	CARYOPHYLLACEAE	Rare	Kumaon and Garhwal, Uttar Pradesh; Nepal.		Subscandent herbs with ascending stems, 60-80 cm tall, branched, pubescent. Leaves acuminate, lower lanceolate, cauline broadly lanceolate to ovate-lanceolate, acuminate with undulate margins, 15-35 x 5-20 mm, bracts similar to leaves. Inflorescence cymose, long pedunculate with distant flowers, laxly subdichotomous. Bracteoles 3-4, mm. Calyx membranous, ovate, campanulate, umbilicate, 13-15 x 6-8 mm, scabrid-puberulous, teeth lanceolate, acute, ciliolate. Carpophore ca 3-4 mm. Petals greenish, narrow, bifid, lobes oblong, linear, ca 7 mm, exceeding the calyx. Styles 3. Capsules ovate, ca 8 x 6 mm. Seeds much tuberculate, back broadly convex, face hollow.

96	<i>Silene kunawarensis</i> Royle	CARYOPHYLLACEAE	Rare	Kashmir, Himachal Pradesh; Pakistan.		Perennial herb with slender stems, puberulous or glabrous. Tufted branches from root stock usually prostrate. Flowering branches slender, 15-30 cm, usually glabrous above. Leaves grass-like, 15-30 mm long, 3-5 mm broad, narrowly spatulate or lanceolate, minutely pubescent on both surfaces, upper leaves gradually smaller. Inflorescence reduced to opposite pairs of flowers at nodes, looking like very lax racemes. Flowers few, nodding, pedicels slender, equal or longer than calyx. Calyx 9-12 x 3-4 mm, membranous, 10-ribbed, quite glabrous, teeth sometimes pubescent, cylindric or subclavate when young, clavate in fruit, base intruded, teeth short, obtuse, with scarious margins. Petals deeply bipartite, without auricles, scales 2, linear-oblong. Capsules ovoid, twice as long as gynophore. Seeds dorsally channelled, sides almost flat.
97	<i>Aneilema glanduliferum</i> Joseph et Rolla Rao	COMMELINACEAE	Vulnerable	Possibly endemic to Arunachal Pradesh at 1800 m alt	Due to habitat destruction	Branched, trailing herb upto 1 m long, rooting at lower nodes. Leaves 3-7 x 1.5-2.5 cm, ovate-lanceolate, acute to acuminate, sparsely pubescent. Panicle 5-15 cm long, terminal, glandular-hairy all over; cymes 3-5-flowered, bracteate and bracteolate, densely glandular; flowers shortly pedicellate; sepals 3, subequal, glandular hairy outside; petals 3, free, blue, 2 larger, shortly clawed, others almost sessile. Stamens 6, 3 fertile, 2 with long filaments, others with short filaments, pubescent; staminodes 3, filaments short, naked. Capsule 0.5 cm long, beaked, 3-celled, cells 2-seeded each, one cell rarely one-seeded. Seeds rugose, pitted.
98	<i>Carex kingiana</i> Clarke	CYPERACEAE.	Indeterminate	Sikkim. Endemic.	Known from the type collection only from Pheedong, Sikkim. (Herb. King).	Spikelets 7-12, linear-cylindric, 2-4 cm long, . androgynous, sublat, interrupted at base. Female glumes triangular at tip; Utricles oblong-ellipsoid, trigonous, 4-5 mm long, glabrous, hispid above. Stigmas 3.

99	<i>Dioscorea deltoidea</i> Wall. ex Kunth	DIOSCOREACEAE	Vulnerable	Himalaya, Kashmir to Assam; Afghanistan; Indo-China; W. China. Rather sporadic.	Due to over-exploitation. It has been observed that it is being depleted rapidly due to excessive collection of its medicinal tubers without any attempt to replenish its natural populations in forest areas.	Glabrous twining climber with tuberous roots. Leaves alternate, 5-13 cm long, ovate, acuminate, base deeply cordate, lobes rounded, sometimes dilated outwards; petiole as long as the blade. Male spikes solitary, rarely in pairs, 8-35 cm long, very slender; perianth segments broadly oblong; flowers in small distinct clusters; stamens 6. Female spikes 8-16 cm long, usually broader than long, solitary, flowers few, distinct. Capsule 1.5-2.5 x 2.5-5 cm, variable in shape. Seeds winged all round, sometimes only on one side.
100	<i>Crotalaria meeboldii</i> Dunn	FABACEAE	Indeterminate.	Shibong, Nagaland.		Perennial herb with woody base, upto 1.2 m tall; stems few, naked before flowering, softly hirsute, especially above. Leaves simple, alternate, chartaceous, very shortly petiolate, 4-6 cm long, narrowly oblong-linear, apex acute or obtuse, apiculate, base acute or obtuse, margins slightly revolute, upper surface glabrous excepting midrib, lower surface and margin with long sparse hairs; stipules linear, deciduous. Flowers blue, subsessile, in dense racemes upto 50 cm long; bracteoles linear. Calyx lobes 1.3 cm long, linear, lanceolate, acute, densely long villous outside. Corolla scarcely longer than the calyx, ornamental with a curved white tomentose line at the base, sparsely sericeous outside at the apex. Pods sessile, glabrous, equal to the calyx.
101	<i>Crotalaria noveoides</i> Griff.	FABACEAE	Indeterminate	Endemic to Khasia hills, Meghalaya.		Plants with-bulbous bases; stems generally simple. Leaves ascending, white-glaucous below. Flowers yellowish; vexillum with chestnut coloured veins.

102	<i>Lloydia himalensis</i> Royle	LILIACEAE	Rare	Barnaj Nullah in Kashmir, Simla in Himachal Pradesh, Tsomgo in Sikkim; Bhutan: Mela and Thang Chu-Rltang and Nepal: Arun valley, Kumgrang La.		Small, 10-17 cm long, bulbous, leafy herbs. Leaves narrow, few, as long as stem, arising from the bulbs, and a few small on the stem. Flowers solitary, 17-25 mm long, campanulate, greenish-white, terminal. Perianth segments 6, free, lanceolate. Stamens 6, free, less than half the length of the perianth; anthers oblong, basifixed. Pistils of 3 united carpels, longer than stamens, with oblong ovary and long style.
103	<i>Nomocharis synaptica</i> Sealy	LILIACEAE	Rare	Thachu valley and Delei valley in Arunachal Pradesh; Namtamaivalley, Burma.	So far collected from two localities in Arunachal Pradesh and one locality in Burma.	Tall, 60 cm-1 m long, bulbous, leafy herbs. Bulbs 3-4 x 2.5-3.5 cm; ovoid, scaly. Leaves alternate, lanceolate, sessile. Flowers 2-4, apical, pink, irregularly purple blotched, saucer shaped, bisexual, hypogynous, bracteate, pedicelled. Perianth segments free, 4-5 x 1.3-2.5 cm, oblong, with a deep coloured bilobed nectary at the base. Stamens 6, as long as 1/4th of the perianth; anthers half the filaments, oblong, dorsifixed. Pistil of 3 unit carpels at the centre, longer than the stamens, ovary as long as style. Capsules obovoid-oblong, 6-lobed, 6-winged with many light brown, compressed seeds.
104	<i>Aspidopterys oxyphylla</i> (Wall.) Juss.	MALPIGHIACEAE	Indeterminate	In India it is recorded from Theria locality in Khasi Hills (Meghalaya). There is no record of its distribution in any other part of the country. Also in Bangladesh.		Twiners. Branches glabrescent. Leaves oblong, ovate-obovate or round-ed, 7-11 cm long, bases acute, apices acuminate; glabrous above, minutely tomentose on nerves beneath, petioles 0.8-1.7 cm long. Panicles decompound, 12-21 cm long, grey-tomentose. Flowers white, pedicels 5-9 mm, articulated below middle at ca 3 mm from base, glabrescent above articulation; sepals ovate, ca 1 x 0.75 mm; petals ovate, ca 3-4 mm long; anthers ovoid, ca 1 mm long, filaments ca 1.2 mm long; ovary glabrous, styles ca 2 mm long, stigma capitate. Samara ovate or orbicular, ca 3 x 1.5-2.5 cm, obtuse at apices.

105	<i>Mitrastemon yamamotoi</i> (Makino) Makino	MITRASTEMONACEAE	Endangered	Mowson forest in Meghalaya; and Japan. The only species of <i>Mitrastemon</i> reported from India and is a good example of transpacific distribution as it was originally reported from Japan.	Causes for its decline and rarity are loss of its host and habitat	A fleshy root parasite, ca 4-6 cm high, dark brownish after drying. Leaves small, scale-like, ca 1-2.3 cm long, ovate or deltoid, margins incurved; flowers ca 2 cm long. Stamens ca 1.5-2 cm long, filaments fused, anthers free, ca 5 mm long, extrorse. Ovary superior, sessile, unilocular; style short with capitate stigma.
106	<i>Bulleyia yunnanensis</i> Schltr.	ORCHIDACEAE	Rare	Arunachal Pradesh; Darjeeling Hills, West Bengal; Bhutan; China	Due to the clearance of forest areas for agricultural purposes (or Jhum cultivation) by which the plant is lost with its host trees	Epiphytes. Pseudobulbs oblong, ca 5 cm long, close, 2-leaved. Leaves linear-lanceolate, acuminate, nerves distinct. Inflorescences arise from the base of pseudobulbs, drooping, many-flowered. Flowers in biserial arrangement, whitish or yellowish; bracts brownish.
107	<i>Aphyllorchis parviflora</i> King & Pantl.	ORCHIDACEAE	Rare	Garhwal; Uttar Pradesh; Lachen, Yumthang, Sikkim; Nepal; S. E. Tibet; in the alt. of 3600-3700 m.		Terrestrial leafless herbs, 10-30 cm high, pale-brown in colour, glabrous. Racemes 4-7 cm long, many-flowered, rachis stout. Flowers ca 4 mm across, sepals subequal, linear, acuminate, spreading, apices recurved; petals externally keeled, pale brown; lip ovate, obscurely lobed, concave. Column very short, rostellum prominent; anther with reflexed margins. Pollinia two, clavate.
108	<i>Bulleyia yunnanensis</i> Schltr.	ORCHIDACEAE	Rare	Arunachal Pradesh; Darjeeling Hills, West Bengal; Bhutan; China	Due to the clearance of forest areas for agricultural purposes (or Jhum cultivation) by which the plant is lost with its host trees	Epiphytes. Pseudobulbs oblong, ca 5 cm long, close, 2-leaved. Leaves linear-lanceolate, acuminate, nerves distinct. Inflorescences arise from the base of pseudobulbs, drooping, many-flowered. Flowers in biserial arrangement, whitish or yellowish; bracts brownish.

109	<i>Calanthe alpina</i> Hook. f. ex Lindl	ORCHIDACEAE	Rare	Uttar Pradesh (Garhwal, Kumaon); Sikkim; Nepal; Bhutan	Destruction of habitats. rendered the species to become rare in its distribution range and is presently known from a few scattered populations in India	Pseudobulbs 2.0-2.5 cm long, sub-cylindric with two or three annular markings. Pseudostem short. Leaves 15-18 x 3.5-5.0 cm, glabrous, oblanceolate, acuminate, sessile. Raceme 15-30 cm long, 4 or 5-flowered. Flowers <i>ca</i> 2.0 cm across, secund; sepals ovate-oblong, 5-nerved; petals elliptic-lanceolate, 3-nerved; lip shorter than sepals with a cylindric spur, without lateral lobes, edges deeply incised and pectinate. Column short broadly winged; spur equaling the sepals, stout, slightly incurved.
110	<i>Calanthe anthropophora</i> Ridley	ORCHIDACEAE	Endangered	India (Garo Hills in Meghalaya); Thailand.		Terrestrial, <i>ca</i> 45 cm tall. Leaves elliptic, plicate. Inflorescence terminal, many-flowered. Flowers white; bracts erect, as long as the pedicelled ovary; sepals ovate-oblong, puberulous, petals clawed towards base, oblanceolate, glabrous; lip 3-lobed, spurred; pollinia 8
111	<i>Calantha mannii</i> Hook. f.	ORCHIDACEAE	Rare	Himalayas: Arunachal Pradesh, Uttar Pradesh (Garhwal, Kumaun), Sikkim & Nepal- Bhutan; Meghalaya (Khasi Hills)		Terrestrial herbs. Pseudobulbs small. Pseudostem <i>ca</i> 8.0 cm long. Leaves two or three, <i>ca</i> 25.0 cm long; oblanceolate-oblong. Racemes 10-12-flowered. Flowers <i>ca</i> 5 mm across; chocolate brown, very small, deflexed after expansion; sepals connivent, ovate-lanceolate; petals linear-spathulate, not spreading; lip 3-lobed, yellow, with a red blotch at apex; spur very short, conical, lip with lateral lobes attached to whole length of column, 3-lamellate from base to near apex.
112	<i>Calanthe pachystalix</i> R.eichb. f. ex Hook. f.	ORCHIDACEAE	Endangered	Himachal Pradesh (Simla), Uttar Pradesh (Mussoorie); Nepal; Indo-China	This species is known only from its type collection and has become endangered in India due to habitat destruction	Terrestrial herbs. Stems short, swollen at the base. Leaves 30-60 cm long, linear-lanceolate, acuminate, many, nerves prominent. Inflorescence in the axils of sheath, usually overtopping the leaves, 20-30 cm long; rachis and pedicels puberulous; bracts deflexed, very small. Flowers dense, <i>ca</i> 2.0 cm across; sepals 3-nerved, ovate-obtuse, reflexed; petals spathulate, 3-nerved, lip adnate to column, 3-lobed, spur cylindric, shorter than sepals. Column very broad

113	<i>Coelogyne rossiana</i> Reichb. f.	ORCHIDACEAE	Vulnerable.	Chandubi in Assam and Sibulatang in Mizoram; Burma.	The main reason for its fast depletion in the wild is due to disturbances in its native habitat, Chandubi being a picnic spot frequently visited by tourists. More-over, the felling of its host trees is also another reason for its vulnerability.	Rhizome creeping, stout. Pseudobulbs ovoid, ridged, yellowish-green, 2-leaved. Leaves oblong-lanceolate, acute, plicate. Inflorescence on young shoots, 1-6-flowered. Flowers 2.5-3.8 cm across, creamy-white. Sepals subequal, oblong-lanceolate. Petals linear. Labellum 3-lobed, the lateral lobes, the base of midlobe and the apex are brown which is sometimes deep or pale or yellow, the midlobe sub-reniform, entire and wavy, the lateral lobes with 3-4 brown nerves, lamellae 3 from base to apex, sometimes 5 on mid lobe.
114	<i>Corybas purpureus</i> Joseph et Yog.	ORCHIDACEAE	Rare	Meghalaya-Khasi Hills. Endemic.		Terrestrial. Tuber small with a very short slender stem. Leaf solitary, sessile, cordate. Flowers solitary, pinkish-white.
115	<i>Cypripedium cordigerum</i> D. Don	ORCHIDACEAE	Rare	Jammu & Kashmir, Himachal Pradesh, Uttar Pradesh (Garhwal) in the alt. 2800-3400 m. Also in Nepal, Bhutan, Pakistan	One of the Lady's Slipper orchids, once reported to be abundant in the North-Western Himalayas, has now become rare, due to widespread ecological degradation in its natural habitats.	Terrestrial herbs, 25-60 cm high, puberulous. Leaves 4-5, scattered, 5-18 x 4-11 cm, orbicular to lanceolate, acute to acuminate at apex, membranous. Bracts leaf-like, 8-10 x 3-4 cm. Flowers solitary or sometimes two; sepals and petals spreading, greenish-yellow or white; dorsal sepal ovate-acuminate; lateral connate; petals equaling dorsal sepal, narrowly lanceolate, acuminate; lip oblong, white, often with purple spots outside; column yellow; ovary glandular-pubescent. Capsule erect clavate, ca 3.8 cm long.
116	<i>Puccinellia kashmiriana</i> Bor	POACEAE	Rare	Jammu and Kashmir (Kamri valley); Himachal Pradesh (Lahul).	Grazing seems to be the main threat factor	Tufted perennial grass, culms 6-23 cm tall, erect. Leafblades flat or folded, 1-5 cm long, 1-1.5 mm wide, green, scaberulous above. Panicle contracted, 1.3-3.5 cm long, branches smooth, very short, bare in the lower part and bearing only 1 or 2 spikelets each. Spikelets 4.5-5 mm long, 2-3-flowered, variegated with purple; glumes oblong-elliptic, acute or subacute, upper 2-2.5 mm long, 3-nerved, lower 1.2-1.8 mm long, 1-nerved; lemmas 3.2-3.5 mm long, oblong-elliptic, acute, the tip compressed and apiculate, glabrous, palea keels smooth.

117	<i>Aconitum falconeri</i> Stapf var. <i>latilobum</i> Stapf	RANUNCULACEAE	Vulnerable	Endemic to Bashahr, Himachal Pradesh	Due to its medicinal properties; there is no appropriate cultivation of this medicinal herb.	Erect, tall herbs with paired roots, 12 x 2.5 cm with few root fibres. Stems up to 1 m tall, slightly hairy above. Leaves scattered, upper leaf blades 3-partite, above 1 cm across, lobes coarsely crenate or dentate. Inflorescence tomentose with spreading hairs. Carpels glabrous.
118	<i>Delphinium uncinatum</i> Hook. f. et Thoms	RANUNCULACEAE	Vulnerable	Kashmir and Himachal Pradesh; Pakistan; Beluchistan and Afghanistan. Recent collection in 1979 by B. S. Aswal from Chamba district of Himachal Pradesh indicates that in recent times the species is known from only one locality in India.		Stem simple, terete, pubescent densely above with spreading hairs. Radical leaves crowded, petiole dilated at the base, 2-12 cm long, laminae 3-5 sect to base, subglabrous to villous, segments narrow-cuneate at the base, pinnately dissected into narrow toothed lobes; cauline leaves reduced, lobes narrower. Inflorescence racemose to subpaniculate, lax, spreading hairy; bracts lanceolate. Sepals bluish-purple to pale, sparsely villous; spur hooked. Petals deeply 2-fid, densely hairy. Follicles 3, straight, glabrous or hairy.
119	<i>Acranthera tomentose</i> R. Br. ex Hook.f.	RUBIACEAE	Vulnerable	Meghalaya; Assam and Nagaland. Endemic	Due to habitat loss	A short undershrub, hirsutely tomentose; stem cylindric, short, sometimes epiphytic. Leaves large, 10-25 cm long, elliptic or oblanceolate, acute, hirsute on both surfaces; stipules interpetiolar, broad, acute. Flowers in short peduncled subterminal bracteate cymes. Calyx tube oblong, lobes 5, persistent, linear-lanceolate, about 2-2.5 cm long. Corolla blue, about 3.5-4 cm long, funnel-shaped, densely villous; lobes valvate, short, rounded. Stamens 5, included within the tube; filaments filiform; anthers included, cohering into a tube, pointed and spurred at their tips. Ovary 1-celled, long, fusiform; style filiform; stigma clavate, furrowed; ovules numerous, in two parietal 2-lamellate placentas. Fruit a berry, oblong, 2-celled, many seeded, about 4 cm long, with persistent calyx lobes.

120	<i>Hedyotis scabra</i> Wall. ex Kurz	RUBIACEAE	Rare	West Bengal, Assam, Arunachal Pradesh; Bangladesh and Burma.		An annual herb or perennial from a stout long woody root-stock; stem -obtusely angular above, terete below, scabrid, sometimes glabrescent below. Leaves opposite, sessile or subsessile, 2-10 x 1.5-2 cm, lanceolate, tapering at both ends, membranous, blackish above, pale below, scabrid above and along the nerves beneath; petioles 1-2 mm long, puberulous; stipules interpetiolar, triangular, pubescent, pectinately gland-serrated. Inflorescence terminate few flowered capitate cymes with 4-6 involucrel ovate-acute bracts. Flowers 4-5 mm long, shortly pedicelled, bracteate, setulose at apex; pedicel 0.3-1 mm long; bracts minute, pectinate. Calyx tube short; lobes 4, minute, triangular-lanceolate, scabrid along the margin. Corolla white, tubular, minutely pubescent outside; tube short, enclosed within the calyx lobes, throat pubescent inside, lobes 4, oblong, 2-3 mm long, minutely pubescent at throat, densely pubescent below. Stamens 4, exserted; filaments 1-1.5 mm long, adherent at sinus of corolla lobes, pubescent; anthers linear-oblong. Style 1-2 mm long, pubescent, enclosed within the corolla lobes; stigma bilobed, papillose. Capsule 2-3 x 2 mm, crustaceous, muricated, glabrous or minutely pubescent, apparently indehiscent, but ultimately divides septically. Seeds 20-40, angular, reticulate, brownish in colour.
121	<i>Ophiorrhiza gracilis</i> Kurz	RUBIACEAE	Indeterminate	Nagaland (Kohima) and Burma (Tenasserim)	Since the area is not fully explored, there could be pockets of habitats where the species could possibly be found.	Small annual herb with simple glabrous erect stem. Leaves opposite, 6.5-22.5 x 2-4 cm, lanceolate or elliptic-lanceolate, caudate-acuminate at apex, tapering at base, membranous, glabrous, pale beneath; lateral nerves 6-10 pairs; petiole 1-2.5 cm long, slender, glabrous; stipules interpetiolar, caducous, 3-12 mm long, subulate, bifid, glabrous. Inflorescence terminal cymes, 1-1.5 cm across; peduncles 2.75-3.2 cm long, glabrous. Flowers subsessile, bracteate, epigynous, 7-8 mm long, white or purple; bracts caducous, linear, glabrous. Calyx obovoid, glabrous; lobes 5, triangular, acute, glabrous. Corolla gamopetalous, 6-6.8 mm long, funnel shaped, glabrous; lobes 5, ovate, obtuse. Stamens 5, adnate to the base of corolla or slightly above, inserted; filaments 2-2.2 mm long; anthers 2 mm long, narrowly oblong. Ovary obovoid; disc 0.4-0.5 mm high; style 2-2.25 mm long, glabrous; stigma bilobed, glabrous. Fruit not seen.

122	<i>Ophiorrhiza griffithii</i> Hook. f.	RUBIACEAE	Indeterminate	Nagaland and Burma	Since this area is not fully explored there could be pockets of habitats where this species may be located.	Small erect herbs, young parts puberulous. Leaves opposite, 7.5-15 x 6-7cm, broadly elliptic, acute at apex and base, glabrous, pale greenish on drying; lateral nerves 12-15 pairs; petiole 1.5-5 cm long, glabrous or slightly puberulous; stipules interpetiolar, 7-15 mm long, upper oblong, lower broadly lanceolate, entire, acute, glabrous. Inflorescence a terminal, corymbose cyme, 2-3.5 cm across, puberulous; peduncle 1-2 cm long, erect, glabrous or slightly puberulous. Flowers bracteate, bracteolate, pedicellate, epigynous, 19-22 mm long, purple; bracts persistent, 9-11 mm long, linear-lanceolate, acute, pubescent on the midrib; pedicel 1.5-2.25 mm long, puberulous. Calyx tube broadly obovoid, pubescent; calyx lobes 5, 1-1.25 X 1 mm, triangular, glabrous. Corolla 17-29 mm long, funnel shaped, glabrous outside, villous at the middle within; corolla lobes 5, broadly ovate, 2-2.25 x 2.75-5 mm, winged at back. Stamens 5, adnate to the middle of corolla tube, inserted; filaments 1.25-1.5 mm long; anthers 2.25- 3.5 mm long, linear-oblong. Ovary inferior, obovoid; disc 1.25-1.5 mm long; style about 4 mm long; pubescent; stigma 2-lobed, pubescent. Capsule 2-lobed, pubescent.
123	<i>Ophiorrhiza hispida</i> Hook. f.	RUBIACEAE	Endangered	Meghalaya and Assam; Burma.		A procumbent herb, hispid all over, branches 10-35 cm long. Leaves opposite, ovate-lanceolate, lateral nerves 6-12 pairs; petiole 0.5-1.8 cm long, stipules interpetiolar, 5-7 mm long, oblong-lanceolate, acuminate. Inflorescence terminal capitate cymes, 1-2 cm across, subglobose, peduncles 0.5-1.5 cm long, stout. Flowers bracteate, bracteolate, epigynous, pedicellate, 5-6.5 mm long, greenish-white or reddish; bracts and bracteoles similar, persistent, concealing the flowers, 4-6.5x 1.5-2 mm, linear- lanceolate, acute, ciliate; pedicels 0.75-1 mm long. Calyx obovoid, lobes 5, 0.75- 1.25x0.5-0.75 mm, ovate-lanceolate, acute. Corolla 4-5.25 mm long, shortly funnel shaped, broad at base, narrowing upwards, hispid outside, villous at the throat within; lobes 5, 1.25-1.5 x 0.75-1.25, ovate-oblong, spreading, acute. Stamens 5, adnate to the throat of corolla or slightly below, inserted or slightly exerted; filaments 0.8-1 mm long, glabrous; anthers 1-1.25 mm long, linear-oblong. Ovary 0.75-1 X 0.6-0.8 mm, glabrous; anthers 1-1.25 mm long, linear-oblong. Ovary 0.75-1 X 0.6-8. mm, obovoid to subglobose; disc 0.5 mm high, style 1-1.5 mm long, glabrous; stigma 2-lobed. Capsule 1.5-2.5-3.5-6 mm, hispid, 2-locular; locules ovate-oblong with straight tips. Seeds 0.3-0.4 X 0.25-0.3 mm, 5-7 angular, glabrous, brown; testa areolate, wall thin, tubercled.

124	<i>Ophiorrhiza lurida</i> Hook.f.	RUBIACEAE	Rare	Sikkim, West Bengal (Darjeeling) to Manipur; also in Eastern Tibet and S.W. China.	Rapid changes in its original habitats have been a source of threat to the species rendering it very scarce in India.	Small herbs copiously rooting at the base. Leaves opposite, 1.25-10 x 0.8-4.5 cm, elliptic-oblong, rarely ovate, glabrous above, puberulous on the nerves beneath; lateral nerves 6-14 pairs; petiole 0.5-3 cm long, puberulous; stipules interpetiolar, 2.5-8 mm long, linear with broad base, glabrous. Inflorescence terminal corymbose cymes, contracted, 0.5-2.5 cm across, glabrous or puberulous; peduncles 1.5-7 cm long, slender, glabrous or puberulous. Flowers epigynous, 5-10 mm long, white; bracts and bracteoles similar, persistent 3-8 mm long, lanceolate or linear-lanceolate, acute; glabrous; pedicels 1-1.5 mm long, glabrous or puberulous. Calyx tube obovoid, pubescent; calyx lobes 5, subulate, pubescent. Corolla 4.5-9.25 mm long, funnel shaped, glabrous; lobes 5, 1.25-1.75 x 0.75-1.25 mm, ovate, acute, glabrous. Stamens 5, adnate to the middle of corolla tube, inserted; filaments 1.25-2 mm long; anthers 1-1.5 mm long, linear-oblong. Ovary obovoid; disc 0.25-0.4 mm high; style 1.25-1.5 mm long, glabrous; stigma bilobed, glabrous. Capsule 1.5-3 x 5-8 mm, glabrous or puberulous, 2-locular; locules ovate-oblong with straight tips. Seeds 0.4-0.5 x 0.3-0.4 mm, 5-7 angular, glabrous, brown; testa areolate with thick tubercled wall.
125	<i>Ophiorrhiza subcapitata</i> Wall. ex Hook. f.	RUBIACEAE	Endangered	Meghalaya (Khasi and Jaintia Hills). Endemic.	Due to destruction of its natural habitats.	A slender hirsute herb with creeping base and ascending branching stem. Leaves opposite, 3.5-15 x 1.5-5 cm, elliptic to elliptic-lanceolate, acuminate at apex, cuneate at base, lateral nerves 5-14 pairs; petiole 1-2.5 cm long, hirsute; stipules interpetiolar, 5-7 mm long, ovate, acuminate, entire, hirsute at margin and on midrib. Inflorescence terminal subcapitate cymes, 0.8-1.8 cm across, contracted, peduncles 2-5.5 cm long, slender. Flowers bracteate, bracteolate, pedicellate, 5-7 mm long, white or pale-green; bracts and bracteoles similar, persistent, 5.5-9 x 2-3.5 mm, lanceolate, obtuse, pinkish when dry, ciliate; pedicels 1-1.25 mm long. Calyx obovoid, hirsute; lobes 5, 0.8-1.2 x 0.5-0.6 mm, ovate-lanceolate, acute, ciliate. Corolla 4-5.25 mm long, broad at base, narrowing upwards, glabrous outside, villous at the throat within; lobes 5, 1-1.3 x 0.7-0.9 mm, ovate-lanceolate, spreading hirsute at back. Stamens 5, adnate to the throat of corolla or slightly below, scarcely exserted; filaments 1-1.3 mm long; anthers 0.9-1.2 mm long, linear-oblong. Ovary 0.8-1 x 0.6-0.8 mm, obovoid; disc 0.5 mm high; style 1.8-2.2 mm long, glabrous; stigma capitate, hirsute. Capsule 1.5-1.75 x 4-4.75 mm, glabrous, 2-locular, locules ovate-oblong, with straight tips. Seeds 0.35-0.5 x 0.5-0.5 mm, 5-6 angular, glabrous, brown; testa areolate, wall areoled, thick, tubercled.

126	<i>Ophiorrhiza tingens</i> Clarke ex Fischer	RUBIACEAE	Vulnerable	Meghalaya, Assam, Tripura state, Nagaland; Burma.	Developmental activities and jhum cultivation are leading to changes in its habitats rendering many species of flora threatened in the distribution range of this species.	Herbs or undershrubs with erect or trailing, simple or branching stem, pubescent above. Leaves 2.5-17 x 1-6 cm, lanceolate or broadly ovate- lanceolate, acute to caudate-acuminate at apex, decurrent at base, glabrous or scattered short hairy above, pale or reddish, puberulous on the nerves beneath, lateral nerves 7-14 pairs; petiole 1.5-4 cm long, pubescent; stipules interpetiolar, persistent, linear-lanceolate, entire or 2- fid, puberulous. Inflorescence terminal corymbose cymes, spreading, puberulous; peduncles elongating on fruiting, stout, pubescent. Flowers bracteate, bracteolate, pedicellate, epigynous, heterostylous, 6- 10 mm long, purple or white; bracts and bracteoles deciduous, linear; pedicel about 1 mm long, puberulous. Calyx obovoid, puberulous; lobes 5, ovate-lanceolate, acute, puberulous. Corolla 5-9 mm long, funnel shaped, broader at base and mouth, glabrous outside, villous at the throat within or slightly below; lobes 5, oblong-lanceolate, slightly curved inwards, keeled at back. Stamens 5, adnate to the middle of corolla tube or slightly below, inserted or slightly exerted; filaments 0.5-1.5 mm or 3-5.5 mm; anthers 1.6-2.3 mm long. Ovary obovoid; disc 0.5-1 mm high, style 2.5-3 mm or 4.5-8.3 mm long, slender, pubescent; stigma 2-lobed. Capsule 2-locular, glabrous. Seeds irregularly angular.
127	<i>Rubia edgeworthii</i> Hook. f.	RUBIACEAE	Vulnerable	Western Himalaya	Due to developmental activities leading to depletion of its natural habitats.	Pubescent herb with ascending branches and densely scabrid 8-ribbed stems. Leaves petiolate, membranous, 4 in a whorl, 4-5.5 x 1-2-1.5 cm, lanceolate, acute or acuminate at apex, attenuate at base, veins 3-5, converging upward deeply impressed on the upper surface; petiole short, 4-5 mm long. Inflorescence axillary and terminal panicle of cymes; peduncle long, scabrid. Flowers bracteate; pedicellate, minute, 2- 2.5 x 1.75-2 mm, pedicels 2-5 mm long, scabrid; bracts in pairs. Hypanthium globose, scabrid. Calyx lobes absent. Corolla gamopetalous, 2-2.5 x 1.75-2 mm, scabrid above; tube very short; lobes 5 or 4, lanceolate. Stamens 5 or 4, epipetalous; filaments 0.5-0.75 mm, longer than the anthers; anthers ellipsoid, 2-lobed, basifixed. Pistil bicarpellary, syncarpous; stigma globose; styles 2, short, united below; disk annular, thin; ovary 0.75-1 x 0.75-1 mm, 2-celled; ovule one in each cell, attached to the base of the septum. Fruit glabrous:

128	<i>Rubia himalayensis</i> Klotzsch	RUBIACEAE	Vulnerable	Western Himalayas, Kashmir; Pakistan; Afghanistan	due to developmental activities and consequent natural habitat changes.	Climbing herbs with long, slender branches and quadrangular prickly stem. Leaves 2, opposite or 4 in a whorl, one pair being larger than the other, 2-6.6 x 1.1-2.7 cm, elliptic-ovate or obovate, subacute or apiculate at the apex, prickly at margin on the undersurface; lateral nerves obscure; petiole 3-9 mm. Flowers pedicellate in axillary and terminal panicle of cymes, bracteate; peduncles long; bracts paired, sessile, foliaceous, 5-7 x 2-4 mm, ovate-elliptic, prickly at margin. Hypanthium globose; calyx lobes absent. Corolla gamopetalous, 2.5-3 mm long; lobes 5, oblong. Stamens 5, epipetalous, alternating with petals; filament ca 0.5 mm long; anthers at the throat of the corolla, 0.75-1 mm long, oblong, 2-lobed, dorsifixed; disc annular, thin, around the style. Pistil bicarpellary, syncarpous; stigma globose, sometimes unequal; styles 2, partly united below; ovary ovoid, 2-celled, ovule one in each cell, attached to the base of the septum. Fruit. 4-5 mm, globose, sometimes didymous. Seeds curved, albuminous; embryo with 2 large cotyledons and one straight axis.
129	<i>Paoua belladonna</i> Deb et Dutta	SOLANACEAE	Rare	Arunachal Pradesh: Tirap district.		A herb with perennial base, branching dichotomously. Leaves simple, subopposite, petiolate, 8-30 x 5.5-20 cm; petiole 1-4 cm long, glabrous; lamina ovate or ovate-elliptic, membranous, slightly undulate, minutely ciliate at the margin, acuminate at apex, attenuate at base, surface with small scurfy scales, more on the upper, falling off in age; midrib distinct; lateral nerves 5-8 pairs, bending gradually downwards. Flowers solitary, axillary, pedicellate, regular, bisexual, pedicel 2.5-7 cm long, scarcely hairy. Calyx gamopetalous, tubular, unlobed, sparsely lepidote, densely punctate, frequently with glands containing brown fluid; tube fleshy, thin on drying, 10-20 mm long, with 5 short teeth, triangular, ciliate at the margin. Corolla gamopetalous, tubular, 2.5-5 cm long, imbricate in bud, densely covered with long multicellular hairs outside, less so inside; teeth 4-5 mm long, deltoid-lanceolate. Stamens 5, attached just at the base of the corolla tube; filaments broad below, gradually tapering to a fine apex, ca 13 mm long, hairy; anthers ca 6.5 mm long, large, 2-lobed, dorsifixed, ovate-lanceolate, mucronate, dehiscent by apical pores; ovary clavate, glabrous, 2 locular with many ovules in axile placentation; style stout, 12-14 mm long, glabrous; stigma 2-lobed. Fruit a berry, oblong, many seeded. Seeds compressed, ovoid, ca 2.5 mm; testa crustaceous, reticulate, brown; embryo peripheric, cylindrical.

130	<i>Alniphyllum fortunei</i> (Hemsl.) Makino	STYRACACEAE	Rare	India, Arunachal Pradesh, Subansiri district, Begi-Amjee; China.		Small trees, up to 10 m tall, much branched, young, parts stellate-tomentose. Leaves alternate, oblong-elliptic, 6.5-19.5 x 3-9.5 cm, subcoriaceous, margins callose-denticulate, sparsely stellate hairy on the back. Inflorescence a lax panicle, axillary or terminal, 6-13-flowered, up to 8.5 cm long, stellate-hairy. Flowers white, ca 2 cm long; calyx cupular, 5-lobed; corolla 1.5 cm, 5-lobed, oblong, stellate-hairy without, silky puberulous within, united at base to a short tube; stamens 10, unequal, alternately long and short, united at base; ovary semi-inferior, ovoid, 3 mm long, densely stellate-hairy, 5-locular, ovules many on axil placentation; style 1 cm long, stellate-hairy, stigma discoid, 5-lobed. Capsule oblong, 5-celled, seeds 2-winged.
131	<i>Huodendron biaristatum</i> (W. W. Sm.) Rehder	STYRACACEAE	Rare	In India this species is so far recorded from Subansiri district, Arunachal Pradesh. Earlier known from China, Northern Burma and Tonkin.	The habitats of the species are under stress due to clear felling of forests for shifting cultivation	Twiggy shrubs upto 3 m high, young parts stellately hairy. Leaves alternate, elliptic-lanceolate, 11.5-14 cm long, 3-4 cm broad, caudate-acuminate, minutely denticulate, venation finely reticulate. Flowers white, in axillary corymbose panicles, stellate-hairy, ca 6 mm long; calyx cupshaped, 5-dentate, adnate to the ovary; corolla 5 x 2 mm, 5-lobed, lobes free; stamens 10, free, ca 4 mm long, anthers 2-lobed, 3-dentate-crested; ovary semi-inferior, 1.5 mm long, 3-celled, ovules many, axile; style 3.5 mm 1 long, minutely pubescent, apex 3-lobed. Capsule ovoid, 3-valved, stellate-hairy.
132	<i>Nardostachys grandiflora</i> DC.	VALERIANACEAE	Vulnerable	Himachal Pradesh to Bhutan; also extending into Tibet and W. China.		Root-stock thick, long, covered with fibres from the petioles of withered leaves. Stem 10-60 cm, generally, pubescent upward, glabrate below, subscapose. Radial leaves 15-20 x 2.5 cm, longitudinally nerved, glabrous or slightly pubescent narrowed into the petiole; cauline 1-2 pairs, 2.5-7.5 cm long, sessile, oblong or subovate. Flower-heads usually 1, or upto 5; bracts 4-6 mm long, pubescent. Corolla tube 6 mm long, somewhat hairy within. Fruit 4 mm long, covered with ascending white hairs, crowned by the ovate, acute, often dentate calyx-teeth.
133	<i>Athyrium duthei</i> (Bedd.) Bedd.	ATHYRIACEAE	Vulnerable	India: North-west and Eastern Himalayas. Endemic.	Causes for its decline and possible extinction are mainly due to loss of its habitat.	Rhizome long-creeping, black, almost naked; stipes 8-10 cm, furnished with a few scales in the basal part; scales pinkish, ovate-lanceolate, deciduous; lamina ovate-lanceolate, 20-30 x 7-10 cm; pinnae alternate, lanceolate, ca 20 pairs, lower ones gradually reduced, the larger ones 3-5 x 1.5-2 cm, pinnatifid in the apical part, texture herbaceous, rachis pinkish, clothed with a few scales, both the surfaces glabrous; veins forked; sori 6-8 per pinnule, mid-way in between midrib and margins..

134	<i>Dennstaedtia elwesii</i> (Bak.) Bedd.	DENNSTAEDTIACEAE	Possibly extinct	India: Lachen, North Sikkim; Tibet in China.	Causes are clearing of forest and destruction of habitat.	Rhizome? Fronds large, lanceolate, tripinnatifid, stipe upto 35 cm long, base black, upper portion brown, glabrous. Lamina upto 60 cm long, rachis stramineous, glabrous, pinnae lanceolate, nearly sessile, upto 6 cm long, pinnae rachis flattened, pinnules 20-30-jugate, lanceolate, sessile, cuneate at base, deeply pinnatifid, ultimate segments erecto- patent. entire, lowest on upper side bifid, both surfaces glabrous, veins solitary in each segment. Sari covering the entire apex of segments.
135	<i>Christiopteris tricuspis</i> (Hook.) Christ.	POLYPODIACEAE	Indeterminate	India; endemic to Sikkim and Darjeeling. Hooker (5) described it on the collection of Mrs. Atkinson from Hot Valley, Sikkim. Clarke (3) did not report it from N. India. Beddome (1) reported it from Goke below Darjeeling. Christensen (2) men- tioned that it was endemic to Sikkim. Holttum (4) opined that it was also available in Malaya, although he mentioned that Malayan and Sikkimese plants have some differences. Mehra and Bir (7), Tagawa (8), Iwatsuki (6) could not find the species in Sikkim or Darjeeling. In the herbarium CAL, there are three old sheets of this species from Sikkim, of which the last collection was made by H. C. Levinge in 1900.	Depleted from the type locality in Sikkim due to deforestation and change of habitat.	Rhizome wide creeping., thick, woody, 4-5 mm in dia., covered with dark brown, shining, linear-subulate, about 5-6 mm long scales with long acuminate apices. Fronds dimorphic. Stipe of sterile frond 20-30 cm long, stipe of fertile frond upto 50 cm long. Sterile fronds upto 50 cm long, deeply trilobed, lobes upto 5 cm wide, edges of lobes thick- ened, not notched, veins not visible. Fertile fronds tripartite, lobes to about 15 mm wide, lower surface completely covered with sporangia apart from thickened edges and midrib, paraphyses present.

136	<i>Drynaria meeboldii</i> Rosenst.	POLYPODIACEAE	Vulnerable	Endemic to a single locality in Manipur, Eastern India. It is described by Dr. E. Rosenstock on A. Meebold's collection no. 7058 from Phalang, Nagarbazar, Manipur; During Botanical exploration tours in 1984 and 1985 in Manipur conducted by Botanical Survey of India, the species has been rediscovered and collected from Moreh in Technopol District after long time gap. In between this period the species has not been collected either from Manipur or from any other part of Eastern India.	due to deforestation for shifting cultivation and forest fires. It is seen growing in some isolated areas in Manipur, Eastern India.	Rhizome creeping, roots densely covered with yellowish-brown tomentose hairs; scales of rhizome lanceolate-subulate, ferruginous, margins of scales lacerate or ciliato-dentate, about 4-5 mm long, 1 mm broad at base. Fronds dimorphic; sterile or nest fronds sessile, adpressed to rhizome, not or slightly lobed, margins entire or slightly repand, base subcordate, lamina ovate or cordate, 5-11 cm in dia., pale brown to scarious. Fertile or foliage frond stipitate, stipe 20-32 cm long, lamina decurrent up to the base of stipes leaving a wing on the stipe. lamina 60-80 cm long, elongate-ovate, deeply pinnati-fid almost to the rachis leaving a narrow wing, lobes oblique, 18-20 cm long, 4.5-5 cm
137	<i>Oreopteris elwesii</i> (Bak.) Holtt.	THELYPTERIDACEAE	Rare	Endemic to an isolated locality near Lachen in North Sikkim, India.	Due to destruction of its habitats	Rhizomes creeping, clothed with many light brown ovate-lanceolate scales, margins entire. Fronds tufted, stipe upto 20 cm long, glabrescent, bright cheshnut coloured, shining. Lamina bipinnatifid, elliptic-lanceolate, 30-55 cm long, narrowed from the middle to both ends; the lower pinnae gradually smaller and running down into mere auricles; pinnae alternate with aerophores at their bases, rachis pale, castaneous, lower surface hairy with white hairs; middle prnae 4.5-6 cm long, lobed to little more than halfway to costa, lobes entire with rounded apices. Veins 3-5 pairs, simpl9 or forked, costa bearing small glands and unicellular hairs on lower surface, grooved on upper surface with a few unicellular hairs on the ridge between the grooves, rest of the surface glabrous. Sori sumargrnal, spores monolete.

138	<i>Hedysarum astragaloides</i> Benth. ex Baker	FABACEAE	Rare	Originally it was collected from Kishtwar (4000 m), Chenab valley (3500m) in Kashmir and Lahul in Himachal Pradesh in 1848. After a lapse of about 85 years it was again collected from only two localities of Lahul in 1938 and 1941. There is no report of this plant (2) since then. Presumably the species occurs in Pakistan also.	Getting depleted mainly by destructive exploitation of its habitats due to grazing.	Perennial, erect. herbs, 20-60 cm high. Stems usually slender, silky hairy. Stipules leaf-opposed, 1.0-1.2 cm long, densely white silky-pubescent. Leaves alternate, 10-20 cm long; leaflets 17-31, upper surface glabrous and with uniformly very minute gland-like dots, lateral veins obscure on both surfaces. Racemes 10-25 cm long, densely 10-30-flowered along the upper part of peduncles. Pedicels 3-5 mm long; bracts distinctly longer than the pedicel. Flowers 16-22 mm long, yellowish. Calyx 5-lobed, 6.0-9.5 mm long, teeth more or less unequal. Vexillum 15.5-18.0 x 6.0-7.5 mm, narrowly obovate, emarginate at apex, shorter than the keels but longer than the wings; wing-auricles 2.5-3.5 mm long, almost equaling the elongated claw. Pods (1-) 2-jointed, stipitate, both sutures apparently crisp winged.
139	<i>Hedysarum cachemirianum</i> Benth. ex Baker	FABACEAE	Rare	Kashmir. It occurs in a few localities, and recorded from Baltal valley and Kolohoi valley (4000m) along north facing slopes; Thajwas (3800m) and on the way to Amaranath at 3700m altitude in Kashmir. Also doubtfully in Pakistan.	Due to impact of tourism and pilgrimage in its habitats	Perennial; erect herb, upto 35-60 cm high. Stipules leaf-opposed, upto 1.5 cm long. Leaves alternate, 7-13 cm long, pinnate with a terminal leaflet leaflets in 10-13 pairs. Racemes axillary, up to 20 cm long, densely 30-40-flowered, in the upper part of the peduncles. Flowers patent or little pendulous; pedicels 2-3 mm long. Calyx up to 10 mm long, densely pubescent, 5-lobed above the middle; upper lobe shorter than the others. Corolla purple-red; vexillum 24-26 x 7-8 mm, narrowly obovate, equaling or little longer than the other petals; wings almost as long as or a little shorter than the keels, claw about 7 mm long. Pods (1-) 2-3-jointed, upto 5.5 cm long, patent or pendulous, terminal, stipes 7-10 mm long, surfaces distinctly reticulate, both sutures ca 1.0 mm broad, entire, winged; joints 1-2 x 1.0 cm.

140	<i>Hedysarum microcalyx</i> Baker	FABACEAE	Vulnerable	Originally the species was collected from-Chenab Valley, Kashmir in 1852, and then from Lahul, Himachal Pradesh in 1860 and Garwhal in Uttar Pradesh 1864, 1877 and 1888. In the present century it was again collected from Simla and Kulu Valley, Himachal Pradesh in 1913, 1941 and 1954, and from Jamunotri in Uttar Pradesh in 1953. Incidentally, all the above areas are potential tourist sites. Also possibly in Pakistan (7).	Due to destruction of its habitat by tourists and grazing by sheep.	Robust, erect herbs, upto 100 cm high, rhizome woody. Stipules 3-5 cm long, membranaceous, sheathing, covering young leaves and inflorescence, connate- along margin. Leaves 10-25 cm long, 3-5-whorled, pinnate with a terminal leaflet, consisting of 6-9 pairs. Racemes axillary, 5-20 cm long, terminal, 5-35-flowered. Bracteoles shorter than calyx-tube. Calyx 5-lobed, lateral and lower lobes nearly equal and longer than the upper ones. Corolla purple, purplish-red or crimson-purple; wings 12-15 mm long, shorter than the vexillum, auricles 2.5-3.5 mm long, slightly expanded at the apex, longer than or as long as the claw; keels 14.5-18.0 mm long, longer than the vexillum. Pods (1-)2-3-jointed with entire wings along the margin-sutures, reti-culately nerved on both surfaces; joints 8-18 x 5-9 mm, elliptic.
141	<i>Allium stracheyi</i> Baker	ALLIACEAE	Vulnerable	Kashmir, Himachal and Uttar Pradesh in India; Nepal. Endemic to Himalayas.	The species is vulnerable due to overgrazing in the alpine meadows of the Himalaya	Small bulbous herbs, 8-20 cm tall; bulbs 3.5-5cm long, elongate-ovoid with parallel fibrous scales. Leaves 2-4, 11-30cmx1.2mm, linear, longer than scapes. Flowers purple or yellow-coloured. 4-5 mm long, oblong-campanulate, on 3-7 mm long pedicel, many, heads subglobose or hemispherical, 1.5-2.5 cm in diam. Stamens and pistil longer and exerted. Capsules ca 4x3mm, globose, oblong, thin papery, with 6 black seeds.
142	<i>Calamus inermis</i> T. Anders	ARECACEAE	Endangered	India: Sikkim Himalaya. Endemic.	This species is depleting at a faster rate.	A robust climber, stem cluster forming; leafsheath 5-6 cm in diam. Leaves pinnate, cirrate, leaf sheath smooth on outer surface, with a distinct knee; leaflets numerous, equidistant, linear-lanceolate, in pairs on each side of the rachis. Inflorescence inter-foliar, about 1 m long; rachillae 8-10 cm long, sinuous, inserted within the mouth of the respective basal bracts. Fruits ellipsoid, 3cm across; fruit-scales deeply channelled at middle, brownish in colour.
143	<i>Livistona jenkinsiana</i> Griff. (Assam Fan Palm)	ARECACEAE	Endangered	Localised in some selected valleys of Sikkim, foot hills of Gubro Purbat, Assam, Naga hills, Khasi and Jaintia hills of Meghalaya and mountain valleys of Lohit and Tirap districts of Arunachal Pradesh (1-4). Endemic to N.E. India	This species due to extensive deforestation and degradation of its ecological niche and exploitation	Shrubs, ca 1.5m tall. Stem solitary, columnar, dull grey in colour. Leaves costapalmate; leafblade slightly bluish (glaucous) on lower surface, distinctly orbicular; leafsegments bilobed at apices. Flowers bisexual, sessile, borne on short tubercle. Fruits globose, about 3 cm in diameter, slightly attenuate at base; fruit skin deep blue. Seeds globose with broad, elongated raphae; endosperm horny.

144	<i>Phoenix rupicola</i> T. Anders	ARECACEAE	Rare	Tista valley of sikkim and West Bengal; Mishmi hills of Arunachal Pradesh and Khasi, Jaintia hills of Meghalaya. Endemic. (1&2).		A dioecious palm of medium height. Leaves are arching from stem; leaflets alternate to sub-opposite, linear, glossy, induplicate folded (folded like V), arranged in one plane on the rachis. Fruits oblong, 20mm x 9mm, deep crimson when ripe; fruit pulp sweet Embryo dorsal (3).
145	<i>Chondrilla setulosa</i> Clarke ex Hook. F.	ASTERACEAE	Rare	India: Jammu and Kashmir		Perennial herbs. Stems 50-70 cm high, suberect, slender. Leaves 5-9x1.1-0.2 cm, often filiform. In florescence terminal. Heads 14-16x0.2-0.3 cm, cylindrical; peduncle small, slender. Outer involucral bracts 0.8-1.2x0.5-0.9 mm, ovate or obovate, glabrous; inner bracts 12-13.5x1.5-1.8 mm, linear or linear-lanceolate with spinules on the midrib. Ligules yellow. Achenes 6.7 mm long, pale-yellow, pappus 6-8 mm long, silvery white.
146	<i>Senecio mishmi</i> Clarke	ASTERACEAE	Vulnerable or Indeterminate	Eastern Himalaya; Meghalaya, Mishmi hills. Endemic		Herbs. Stem slender, reddish-brown on drying. Leaves broadly oblong, acuminate, glandular, pubescent, sessile with broad auricles, auricles produced backwards. Capitula radiate, campanulate, yellow. Ray florets flat, ligulate, epappose. Discflorets yellow, pappose. Achenes small, oblong, -angled, glabrous. Pappus white.
147	<i>Senecio rhabdos</i> Clarke	ASTERACEAE	Rare and restricted	North-Eastern India : Nagaland, Manipur, Endemic		Perennial sub-shrubs, stem and branches densely brownish-pubescent. Leaves elliptic-lanceolate, acute or acuminate, blackish, scabrid, reddish, pubescent on the veins on the upper surfaces; petioles biauriculate at the base. Capitula radiate, in terminal corymbs. Achenes cylindrical, pubescent. Pappus 3.5 mm long, yellowish.
148	<i>Synotis simonsii</i>	ASTERACEAE	Indeterminate	Eastern India; Assam. Precise locality is not known		Glabrous shrubs. Leaves broadly elliptic, acute, glaucous, venation prominent, reticulate, petioles 5-7 mm long. Capitula discoid, yellow, small, 8-16 flowered, in axillary corymbose panicles. Peduncles ca 2mm long. Achenes 5-ribbed, glabrous. Pappus white
149	<i>Begonia aborensis</i> Dunn	BEGONIACEAE	Rare	Abor Hills, Arunachal Pradesh. Endemic.		Acaulescent, rhizomatous herbs. leaves petiolate, obliquely cordate-ovate, acuminate at apex, base sinuate, dentate to denticulate at margin, lamina variegated, Peduncle 20 cm long. Flowers rose in colour , 4-5cm in diameter, umbellate, bracts oblong ovate, 2-3 cm long, Male flower: pediculate, tepals 2+2, the outer rotundate to ovate, the inner ovate, small, stamens indefinite, filaments 7mm long, anther 2 mm long. Female flower: 1-3, styles 3, jointed at the base, 7 mm long; fruit globose 1-8 cm in diameter, 4-loculed.

150	<i>Begonia brevicaulis</i> DC.	BEGONIACEAE	Endangered or possibly Extinct.	Khasia, Terai, Meghalaya	It might have been lost due to rapid destruction of the area for habitation and cultivation of commercial crops.	Rootstock tuberous. Stemless. leaves 3-8 cm, nearly orbicular, not very unequal at the base, crenate-dentate at margin, hardly ciliate, glabrous or few scattered hairs above, rarely with minute pubescence on the nerves beneath; petiole 2-7 cm long, succulent. Scape 7-12 cm long, sometimes with a small leaf above the base, weak with few small flowers. Male flowers: tepals 4, the outer 2, round, the inner 2, narrower, stamens numerous, shortly monadelphous, anthers oblong. Female flowers: not seen. Capsule 0.5-1 cm, recurved, styles deciduous, two smaller wings very narrow, broader wing descending, its upper margin concave, very thin. Seeds short, ellipsoid.
151	<i>Begonia burkillii</i> Dunn	BEGONIACEAE	Rare	Restricted to Abor Hills in Arunachal Pradesh. Endemic		Acaulescent glabrous herbs. Rhizome creeping. Leaves with 7-12 cm long petioles, lamina spotted becoming black, cordate-ovate or lanceolate, 10-20 cm long, sinuate-dentate or often entire at margin, acuminate at apex, oblique at base. Inflorescence 4-12 cm long, rising above, branched, 3-8-flowered. Pedicel slender, 3-5 cm long. Bract membranous, oblong-caudate, 1-2 cm long. Male flower: tepals 2+2, the outer pale rose, obovate or oblanceolate, acute, 3-4 cm long, the inner narrowly small; stamens indefinite, free, 7 mm long; anther 2 mm long. Female flowers: solitary, thin slender scape 4-5 cm long; tepals are like of male flowers styles 2, united at base, 8 mm long, branched. Fruit rhomboid. 2 cm long, 1.5 cm in diam, 4-loculed.
152	<i>Begonia lushaiensis</i> C.E.C. Fischer	BEGONIACEAE	Rare	Lushai Hills, Sialsuk, Mizoram. Endemic		Erect herb, caulescent, puberulous. Leaves alternate, ovate, acuminate at apex, unequally truncate at base, sinuate to dentate (1.5te at margin); petiole 1-8 cm long, pilose, stipules lanceolate to linear-lanceolate. Inflorescence both axillary and terminal. Male flowers pedicellate, 1 cm long, the outer tepals 2 suborbicular to subcordate, subacute at apex, the inner tepals lanceolate to linear-lanceolate, acute at apex; stamens 18-20, each 4 mm long. Female flowers: pedicellate, tepals 5, the outermost suborbicular, 1-1.3 cm long, glabrous, the inner lanceolate. Ovary elliptic-oblong, 5-6 mm long, 3-locular; styles 3, stigma lunate, pubescent, placenta bifid.
153	<i>Begonia rubella</i> Buch.Ham. Ex D. Don	BEGONIACEAE	Rare	India: Sikkim, Nepal. Endemic to outer parts of Eastern and Central Himalaya		A rather delicate plant, 40 cm high with triangular long pointed leaves with often irregular heart-shaped bases, serrate to dentate at margin. Flowers pink, ca 2 cm across, borne on a long peduncle. Capsules glabrous with unequal wings.

154	<i>Begonia rubrovenia</i> var. <i>meisneri</i> Clarke	BEGONIACEAE	Rare	Khasi Hills, Meghalaya, India. Endemic	Shortly caulescent. Leaves linear-lanceolate, densely tomentose on the nerves beneath, 5-9 x 1 cm; petiole nearly 1.5 cm long, pubescent, peduncles nearly 6 cm long, usually divided near the top and few-flowered. Male flower: tepal 2+ 2, the outer rounded, the inner narrower; stamens numerous, very shortly monadelphous. Female flower: tepals 3+ 2, inner gradually smaller. Capsules small, 1.5 x 2 cm including the wings, the broader wing much descending, its upper edge concave. Seeds ellipsoid.
155	<i>Begonia satrapis</i> Clarke	BEGONIACEAE	Rare	Rungeet Darjeeling district; Sikkim. Endemic	Rootstock of a few tubers. Stem erect, usually elongate above the leaves, pubescent, whole plant 24-30 cm high. Leaves reniform, 2-3x8-10 cm, nearly equally cordate, minutely denticulate-ciliate, closely pubescent above, rufous-villous on the nerves beneath. Petiole of the cauline leaf usually short, often less than 2 cm. Peduncle elongate, very pubescent, bright rose-red, often 12 cm long above the highest leaf. Bracts oblong-lanceolate, persistent. Male flower: tepal 2+2, the outer pubescent, the inner smaller, glabrous; stamens ca 50, monadelphous; anthers obovoid; connective not produced. Female flower: tepals 3+2, the outer larger, pubescent; styles 3, nearly separate, each divided halfway into two tortuose branches. Capsules large, very pubescent. Seeds light brown, shortly ellipsoid.
156	<i>Begonia scintillans</i> Dunn	BEGONIACEAE	Indeterminate	It is so far reported only from the Abor Hills in Arunanchal Pradesh. Endemic.	Acaulescent monoecious herbs; rhizome long, creeping. Leaves obliquerotundate to cordate, 6 -10 cm long, acuminate at apex, minute-dentate at margin, lamina densely pubescent, rarely pilose; inflorescence peduncled, peduncle 3-12 cm long having 2 male flowers and one female flower, outer sparsely pilose, Pedicel 2-3 cm long. Male flower tepals 2+ 2, the outer 2 unequal, ovate, 2 cm long, the inner smaller, ovate; stamens numerous, 3 mm long, anther 1 mm long. Female flower : tepals are like of male flower; styles 3, basal united, 4mm long, stigma tortuous, Fruit (immature) rhomboideous, 1 cm long and, 6 mm in diameter.

157	<i>Begonia scutata</i> Wall. ex DC.	BEGONIACEAE	Rare	Himalaya: Sikkim, West Bengal (Darjeeling); Nepal; Peninsular India.	Tuberous herbs. Plants glabrous, 7-10 cm high, stem filiform. Leaves cordate at base, margin irregularly serrate, acute at apex, petiole 2-4 cm, terete, glabrous. 17flowers in axillary or terminal dichasial cymes, 2-3-flowered, spreading, glabrous, monoecious; peduncle 5.5-6.5 cm; male flowers: tepals 2+2, the outer larger, 5x4 mm, the inner smaller, narrow lanceolate, 2-3 mm long; stamens ca 20, 1 mm, shortly monadelphous, anthers obovoid. Female flowers : tepals 2+ 1, the outer rounded, 4-5 mm in diam, lateral one smaller, less than 5 mm; styles 3, 2 mm, unequally branched, divided halfway up into two unequally curved branches, persistent. Capsule with one wing 9 mm wide and the other 2 mm wide. Seeds ellipsoid.
158	<i>Begonia tessaricarpa</i> Clarke	BEGONIACEAE	Indeterminate	Assam. (without specific locality). Apparently endemic.	Creeping herbs with 0-4 cm long stems. Leaves 4-8 cm long, broadly ovate, gabbros or minutely pubescent on the nerves beneath; petiole 12-25 cm long, pubescent upwards. Inflorescence much shorter than the petioles. Flowers much smaller and less succulent. Capsules sub pyramidal, 4-celled, slightly pubescent, carpels acutely keeled, and ending upwards in a short linear patent horn. Seeds are alike.
159	<i>Belonia watti</i> Clarke	BEGONIACEAE	Endangered	Naga Hills Nagaland. Endemic	Herbs, 10-15 cm high, puberulous. Rhizome short. Leaves large, petiolate, cordate-ovate, acute at apex, double serrate at margins. Flowers both axillary and terminal, rose-coloured. Male flowers: tepals 2+2, the outer two large, ovate-rotundate, the inner small, obovate. Female flowers: tepals 3 + 1, the outer larger, kidney-shaped, the inner smaller, elliptic. Capsule 3-winged, pubescent, wings one larger and two smaller, 2-locular, placenta bifid.
160	<i>Begonia wengeri</i> C. E. C. Fischer	BEGONIACEAE	Indeterminate	S. Lushai Hills (Mizoram). Endemic.	Erect herbs; root-stock small, fibrous. Stem terete, wiry, sometimes rooting at the lower nodes, densely clothed with hairs, 5-10 cm high. Leaves membranous, rotund- ovate, 1.5-5.5 cm, base shallowly cordate, dark green and sparsely hairy; peduncle, its branches and pedicles densely hairy with crisped, multicellular, rufous hairs; bracts foliaceous, ovate to orbicular in outline. Male flowers: the outer tepals 2, broadly obovate, obtuse, 3 mm long, the 2 inner smaller, subacute; stamens about 12, united below, filaments short, anthers oblong. Female flowers: tepals 5, white, elliptic-oblong, the innermost smallest. Ovary trigonous, 3.5 mm long, puberulous on the angles; styles 4, shortly united at the base, hairy; stigma densely hairy. Capsule winged, 1 cm long, one wing wider than the other two, glabrous.

161	<i>Capparis pachyphylla</i> Jacobs	CAPPARACEAE	Vulnerable	Endemic to Lohit and Tirap Districts of Anmachat Pradesh.		Shrubs or small trees; branches scrambling; twigs brown-pubescent, later glabrescent; stipular spines patent, 1-3 mm long, straight or curved; cataphylls conspicuous at base of shoots. Leaves coriaceous, glabrous, elliptic-oblong, 8- 13 x 4- 5 cm, dark- green above, light-green beneath, subcordate at base, rounded, obtuse-mucronate at apex ; lateral nerves 5- 6 pairs; petioles 3- 5 mm. Flowers white or purple, 6- 8 (-10) together in racemose bundles on an axillary or lateral puberulous statk, 2- 3 cm long, sometimes in the form of a panicle; pedicels filiform, 5- 7 mm long, subglabrous. Sepals subequal, 5 -6 x 2- 3 mm, sparsely puberulous inside, ciliate at margins. Petals 6 -7 x 2 m, white, turning pink, puberulous inside, fringed with long hairs. Stamens 32- 34. Gynophore glabrous; ovaly small, gtabrous. Fruits unknown.
162	<i>Silene khasiana</i> Rohrb	CARYOPHYLLACEAE	Indeterminate	Meghalaya, Khasi Hills, at an altitude of 1500-1800 m		A straggling brittle herb. Stem glandular-pubescent above, subscentent, branches stout. Leaves 25-40 mm long, 15-20 mm broad, sessile, ovate, acuminate, 3-5 berved at base, pale beneath, glabrous of sparsely pubescent, ciliolate. Flowers in terminal short cymes or solitary, bracteate, erect, pedicels 12-25 mm; calyx 8-9 mm long, cylindric, with 10 ribs, base rounded, teeth broad-acute, petals pale-pink, claw cuneate, obtuse, scales small. Anthers didymous, filaments glabrous, gynophore very short. Capsule oblong, broad, with very small teeth. Seed dorsally rounded, sides convex with rows of tubercles.
163	<i>Silene vagans</i> Clarke	CARYOPHYLLACEAE	Indeterminate	Endemic to Nagaland		A scandent herb with pubescent stems and climbing branches. Leaves lanceolate, acuminate, narrowed at the base, scarcely trinerved. Inflorescence terminal, lax dichotomous cyines, few-flowered. Bracts minute, inserted at the middle of pedicels. Calyx cylindric, pubescent, constricted below capsule, base truncate, pubescent, teeth lanceolate, acute. Capsule cylindric or ovoid, teeth 6, situated on a short carpophore. Seeds convex on the dorsal side, tuberculate.

164	<i>Kalanchoe rosens</i> Clarke	CRASSULACEAE	Endangered	N.E. India Kohima Nagaland Manipur region endemic.		Succulent perennial herbs, erect branched; stem stout, terete, glabrous; roots fascicled, tuberous above. Leaves persistent, petiolate, exstipulate, simple, opposite, decussate, 3.8-9.5x0.8-2.8 cm. elliptic or narrowly obovate, obtuse at apex, acute at base, serrulate at margin, glabrous. Flowers 20 or more, bracteate, pedicellate, 4-merous; pedicel 4-7 mm, stout, glabrous; calyx tube 1.0-2.0x4.5-5.0mm, obconic, glabrous; teeth 4; corolla pink or rose coloured, tube 10-11 mm long, urceolate, glabrous; lobes 4, twisted, acute at apex, glabrous outside, puberulous within; stamens 8 in two whorls, slender, glabrous, adnate near the mouth of the corolla tube; anthers globose, basiflexed, dehiscing longitudinally; hypogynous scales 4 at the base of carpels outside, linear, notched at apex, glabrous; carpels 4, 8-9 mm, free; ovary 5-6x1.5-2.0mm 1-loculed with many ovules attached at the edge; style 13 mm, glabrous; stigma 0.3-0.5 mm, simple, glabrous.
165	<i>Scleria alta</i> Boeck	CYPERACEAE	Indeterminate	Assam, Meghalaya		Perennial, robust herbs. Leaves 30-60 cm long, middle leaf sheaths winged, secondary b
166	<i>Elaeocarpus acuminatus</i> Wall. ex Mast.	ELAEOCARPACEAE	Rare	India; Meghalaya and adjacent Bangladesh. Localized within a restricted geographical area. In Meghalaya the species is restricted to only Mawmai sacred forest grove, which represents the relic vegetation of Khasi Hills.	Main cause for its rarity appears to be habitat destruction.	Trees, 15- 20 m tall. Leaves 5- 14 X 1.5- 3 cm, lanceolate, elliptic-lanceolate or elliptic-oblong, acuminate at apex, acute at base, margins crenate-serrate, glabrous with age, coriaceous. Petioles 1 -1.5 cm long, thickened at apex, geniculate, pubescent. In- florescence axillary, racemose. Flowers 1 - 1.5 cm across, white. Pedicels 1- 2 cm long. Sepals 5, 8- 10 mm long, villous without, adpressed pubescent within. Petals 5, 7 -9 mm long, oblong-cuneate, narrowed at base, lacinate, long silky hairy on both surfaces. Stamens 35 -40; filaments ca 2 mm long; anthers 3 -4 mm long, shortly awned. Ovary superior, 2-loculed; ovules in 2 rows in each locule. Drupes ca 2.5 cm long, oblong, smooth.

167	<i>Elaeocarpus prunifolius</i> C. Muell. Mast	ELAEocarPACEAE	Rare	India : Meghalaya, Manipur; and adjacent Bangladesh. Localized within a restricted geographical area. The species is restricted to 'Sacred groves', in India	Causes for its rarity and possible extinction may be deforestation for development or agricultural purposes.	Trees, 5-20m tall. Leaves 5- 12x2-2.5 cm, oblong-lanceolate to elliptic-acute to acuminate, base cuneate, crenate-serrate or sub-entire. Petioles 1-3cm long, swollen and geniculate at apex. Inflorescence 3-9 cm long, axillary racemes, silky pubescent. Bracts leafy, spatulate, caducous. Flowers 5-10 mm across, white or pale yellowish. Sepals 5, 5-8mm long, pilose or glabrate without, thinly appressed hairy within. Petals 5, 5-10mm long, oblong, lacinate, addressed silky on both surfaces. Stamens 15-30; anthers ca 2mm long, shortly awned. Ovary superior, oblong, silky. Drupes 1.5-2 cm long, oblong-ovoid. Pyrene ovoid, rugose, obscurely 3-angled.
168	<i>Gleditsia assamica</i> Bor	FABACEAE	Indeterminate	Endemic to hills of N.E. India, particularly in Arunachal Pradesh, Meghalaya and Nagaland.	The species has either been lost due to the practice of slash and burn cultivation by the local tribals or it has escaped attention of plant collectors as it does not flower every year (1).	Trees, upto 10 m tall; trunk cylindrical with branched thorns towards base; bark conspicuously lenticellate; branchlets tomentose. Leaves 15 cm long, pinnate, alternate; rachis grooved, tomentose; leaflets 30 or more, alternate or subopposite, 3.0-3.5 x 0.8 -1.0 cm, oblong, sometimes falcate, base oblique, margin serrulate-crenate, apex obtuse, venation reticulate, distinct. Racemes congested, axillary from the scars of fallen leaves or terminal; rachis striate, densely fulvous-pubescent, many-flowered; bracts minute; pedicels 4 mm long, addressed pubescent. Receptacle 3 mm long, dark brown, bowl-shaped, densely hairy without, sparsely within, rim ciliate with yellow silky hairs. Sepals 5, 3 mm long, oblong-lanceolate, acute, densely tomentose outside and sparsely inside. Petals 5, 3 mm long, oblong or oblanceolate, obtuse, tomentose on both surfaces. Stamens 10, very rarely J 2, inserted on the tip of hypanthium ; filaments 4 mm long, strap-shaped, silky hairy on the inner face towards base; anthers oblong-obtuse, versatile with cordate base. Ovary 4 -5 mm long, oblong, densely yellow tomentose. Pods 4.0- 4.5 x 3.0- 4.5 cm, oblong, acute, shortly stipitate, flat, leathery, dark brown. Seeds not seen.
169	<i>Pueraria bella</i> Prain	FABACEAE	Rare	In india, it is restricted to Abor hills, Mishmi hills and Tirap district of Arunachal Pradesh in N.E. Region	Loss of natural habitat is the apparent cause of its rarity.	Perennial woody climber. Leaves 3-foliolate; petiole 6-8 cm; leaflets elliptic, 8-18x3.5-8cm, long acuminate, subcoriaceous. Inflorescence unbranched pseudo-racemes, up to 35cm long; bracts and bracteoles caducous. Calyx campanulate, shortly pubescent on both sides, tube 4-6 cm long, teeth unequal. Vexillum orbicular-ovate, 14-17x12mm, white or pale violet; wings pale-violet, 14-16x4-6mm; keels 13-16x4-5mm, pale violet. Stamens monadelphous, ca 14mm long. Ovary elongate, 9mm long, pubescent, with ca 15 ovules; style short, glabrous; stigma subglobose. Pods unknown.

170	<i>Rhynchoglossum lazulinum</i> Rao & Joseph	GESNERIACEAE	Rare	Arunachal Pradesh: Kameng and Subansiri districts. Endemic to a narrow distribution range		
171	<i>Juncus sikkimensis</i> Hook.f.	JUNCACEAE	Rare	India. So far known from Sikkim Himalaya only		Perennial, glabrous herbs, Rootstocks very stout, creeping. Stem base stout, clothed with red-brown rigid sheaths, 1.2-2.5cm long; stem and channelled leaf solid, soft. Leaves solitary or few, terete or compressed, equalling the stem. Floral bracts broad, membranous, equalling the flower; lower bracts foliaceous, sheathing longer than the heads. Flowers sessile, sepals 8.5-12 mm long, smooth, shining, dark brown, linear with membranous tips. Stamens 4-6 mm long; anthers linear, at length twisted. Ovary small; style very slender, exserted; stigmas long. Capsules hardly exceeding the sepals, obovoid, acute, shortly beaked, dark brown, shining, 3-septate. Seeds with short stout tails.
172	<i>Lagerstroemia minuticarpa</i> Deberm. ex. P. C. Kanjilal	LYTHRACEAE	Rare	Endemic to Assam and Sikkim.		A tree, up to 35 m tall; stem very irregularly fluted; bark greenish white, exfoliating in large thin papery sheets of scrolls. Leaves opposite, 6 -12 x 3 -5 cm, elliptic or oblong, acuminate at apex, sub-rounded at base, sub-coriaceous, glabrous above, 1 midrib and veins pubescent beneath, petiolate. Panicles terminal, 7 -10 cm long, densely pubescent. Calyx tube broadly campanulate, ca 6 mm long, pubescent, 12-ribbed; lobes 6, triangular, acuminate, upper half pubescent within. Petals 6, ca 2.5 mm long, oblong, crumpled. Stamens numerous, 6 stouter and longer than the rest. Ovary subglobose, 6-loculed; style long, exserted; stigma capitate. Capsule ca 5 x 3 mm, ellipsoid, 3- 6 -valved. Seeds ca 5 mm long, winged.
173	<i>Aibertisia mecisfophyla</i> (Miers) Forman	MENISPERMACEAE	Indeterminate	Its precise locality of occurrence is not available in records. Assam and Meghalaya. Endemic.	The species may have been lost due to extensive loss of forest	Large climbers; branchlets ferruginous tomentose when young, with cup-like petiole scars present. Leaves 17 -22 x 4 -7 cm, lanceolate-oblong, acuminate at apex, rounded at base, glabrous above, pubescent or tomentellous on midrib and nerves beneath ; nerves 7 pairs, ascending, anastomosing near margin; petioles 3-5 cm long, swollen, tomentellous. Male inflorescence axillary, tomentose when young. Male flowers: sepals tomentose above; stamens many. Female flowers and fruits not seen.

174	<i>Cyclea debiliflora</i> Miers	MENISPERMACEAE	Indeterminate	Endemic to Meghalaya.		Climbers, branches striate, pilose or glabrous. Leaves 8-15 X 5-8 cm, deltoid-ovate, mucronate at apex, truncate or rounded at base, papery, glabrous above, pilose beneath, palmately 5- 7 nerved; petioles 1.0--2.5 cm long. Male inflorescences lax, branches filiform. Male flowers: Sepals campanulate, glabrous. Petals cyathiform, 1 -1.5 mm long. Synandrium ca 2.5 mm long. Female flowers not seen. Inflorescence up to 12 cm long. Drupes obovoid, compressed, pilose; endocarp tuberculate; seeds curved.
175	<i>Cyclea watti</i> Diels	MENISPERMACEAE	Indeterminate	Endemic to Nagaland		Climbers. Leaves 6 -9 x 3 -5 cm, broadly ovate or lanceolate, acuminate at apex, truncate at base, glabrous above, pilose beneath; petioles 3- 5 cm long, glabrous. Male inflorescence subaxillary, 4- 6 cm long, pilose; pedicels 1- 1.5 mm long; bracts foliaceous; bracteoles 1- 1.5 mm long, ovate, acute, pilose. Flowers glabrous; sepals 5- 8; I -1.5 mm long, oblong or elliptic; petals 4 -7, unequal, obovate or linguiform; synandrium 0.5 -1 mm long. Female flowers and fruits not seen.
176	<i>Vanda coerulea</i> Griff. ex Lindl.	ORCHIDACEAE	Rare	India: E. Himalayas and NE region. (The species was first collected from Khasia hills by Griffith. Subsequently it was located in parts of Assam, Arunachal Pradesh, Manipur, Meghalaya and Nagaland in NE India). Also reported from Burma and Thailand.	The wild population of this species have been greatly depleted due to exploitation and habitat destruction throughout its distribution range.	Epiphytic herbs; stems stout, robust, upto 15-60 cm high. Leaves 10-20 x 1.4 x 2.5 cm, strap-shaped, obliquely truncate at apex, leathery, keeled, stiff, dark green. Inflorescences 1- 3, erect or suberect, 25- 60 cm long, 10- 20 -flowered. Flowers 7- 10 cm across, pale lavender or dark blue; sepals and petals 4.0- 4.5 x 2.0- 2.5 cm, obovate or orbicular-oblong, obtuse or rounded at apex, spreading, obscurely tessellate; labellum 3-lobed, 2.2 cm long, linear-oblong, dark blue; lateral lobes ca 2 mm long, cuspidate, incurved; middle or apical lobe linear-oblong, emarginate at apex, fleshy, with 2 keels ending in swollen tips ; spur ca 5 mm, concial, obtuse.

177	<i>Argostemma khasianum</i> Clarke	RUBIACEAE	Indeterminate	North-east India-Meghalaya; endemic.	The species has not been collected after the type gathering though the locality has been botanised in the recent years.	Erect delicate herbs, unbranched, rooting at the base. Leaves opposite or in whorls, petiolate, membranous, ovate or elliptic-lanceolate, acute or subacute at apex, cuneate at base, 8 -13 x 4 -8 mm, glabrous, midrib not so prominent: lateral veins 4- 5 pairs, proceeding to some extent along the midrib and then arching towards the margin; petiole 2- 4 mm long, slightly pubescent; stipules persistent, interpetiolar, 0.3 X 0.2 mm, triangular, acute at apex, pubescent. Inflorescence pendunculate, solitary or 2 -3 together. Flowers white; peduncle ca 8 mm long, bracteolate, pubescent; pedicel 3 -4 mm long, pubescent. Hypanthium 0.7 X 0.8 mm, ovate, pubescent; calyx tube 0.3 X 1.0 mm obovate, pubescent outside, glabrous within; teeth 4, 1.3 X 0.8 mm, elliptic-ovate, acute at apex, hirsute; corolla tube 1.2 mm across, puberulous outside, glabrous within; lobes 4, 2.3 x 0.5 mm, membranous, oblong-lanceolate, acute at apex, cuneate at base, hairy at margin; stamens 4, free, filament very short; anthers ca 2 mm long, linear-oblong, basifixed ; ovary small, obovate; style as long as or slightly longer than the stamens, filiform; stigma capitate. Fruit not known.
178	<i>Indopolysolenia wallichii</i> (Hook.f.) Bennet	RUBIACEAE	Rare	North India: Jowai & Cachar, Meghalaya, Endemic	Its natural habitats are vulnerable due to shifting cultivation	Erect, branched herbs; stems stout, terete or 4-angled, pubescent, internodes short. Leaves opposite, decussate, petiolate, 2.5-9.5x0.3-1.4cm, linear-lanceolate, acuminate at apex, acute at base, subcoriaceous, glabrous above, pubescent on the nerves beneath; lateral nerves 7-18 pairs, alternate, slender, more prominent beneath; petioles 0.3-1.0cm, pubescent; stipules persistent, interpetiolar, 4-8x2.5-4.0mm, 3-fid, membranous, sparsely pubescent. Inflorescence terminal peduncled heads, 2-3 cm across, pubescent; peduncle 0.7-2.5 cm, pubescent; bracts ca 4x3 mm, 3-fld, membranous, pubescent. Flowers 5-16, bracteate, subsessile, 5-merous; pedicels up to 2 mm, pubescent; hypanthium ca 2x2 mm, obovate, pubescent; calyx tube ca 2.5 x 2.5 mm, obovate, pubescent on 22-30mm long, 1-3 mm across, infundibuliform, pubescent outside, villous within above; lobes 5, ca 2.0x1.5 mm, ovate-triangular, acute at apex, pubescent; stamens 5, attached at the middle of the corolla tube; filaments ca 2mm, stout, glabrous; anthers ca 2mm, dorsifixed, 2-lobed, pubescent, dehiscent longitudinally; ovary ca 1.5x1.2 mm, 2-loculed; ovules many in each locule on peltate placent; disk ca 0.4x1.5mm, conical; style 16-23 mm, slender, glabrous; stigma 2-lobed, lobes 0.5mm, pubescent. capsules 3-4x3-5 mm, hemispherical, membranous, pubescent, dehiscent at the top through opericulum; seeds many, 0.6-0.7x0.3 mm, obovate-triangular, sparsely pubescent.

179	<i>Neanotis oxyphylla</i> (G.Don) Lewis	RUBIACEAE	Rare	India: Endemic to Meghalaya.		Undershrubs or erect large herbs, 30- 45 cm in height. Leaves subsessile, 7- 14x0.5 -1.4 cm, linear-lanceolate or lanceolate, acuminate, tapering to the base, coriaceous, black when dry; stipules free ovate-lanceolate or lanceolate, toothed. In florescence terminal peduncled subcorymbose cymes with slender erect peduncles and pedicels. Flowers 7- 8 mm long, white. Calyx 4 -lobed, 0.8 -1 x 0.3 -0.8 mm, ovate acute, Corolla much longer than calyx lobes; stamens exserted; filaments 1 -1.5 mm long, adnate at the throat of corolla tube. Ovary 2-loculed; ovules 4- 10 in each locule on subglobose placenta with a basal stalk; style short, included; stigma bilobed, linear, papillosc. Capsules subsessile or shortly stalked, 2.5- 3 x 2.5- 3 mm, globose, didymous, turgid, crown hemispheric, dehiscence loculicidal. Seeds 8-10 in each locule, 0.3- 0.5 x 0.5 mm, sub globose or elliptic, slightly convex on one face and with longitudinal ridges; testa black, loosely
180	<i>Cleyera japonica</i> Thunb. var. <i>grandiflora</i> (Wall. ex Choisy) Kobuski	THEACEAE	Rare	So far known from Meghalaya in North-Eastern India, endemic. It is not even reported from the Garo and Jaintia Hills in Meghalaya.	Much of the forests in Meghalaya have been cleared for 'Jhum' cultivation, perhaps rendering this taxon rare.	Medium or small sized tree up to 8 m high; bark grey, crown lax. Leaves alternate, 6- 12 x 1.5- 4 cm, elliptic, shortly acuminate, base acute or cuneate, entire; lateral nerves indistinct, 15- 19 on each half; petiole 4- 6 mm, long glabrous or sparsely ciliate. Flowers pedicillate, 1-1.5 cm in diam., axillary, fascicled, yellow. Sepals 5, free, orbicular, 3.5- 4 x 3 - 3.5 mm, glabrous, ciliate at the margins. Petals 5, 8 - 5 mm, connate at base, elliptic, glabrous. Stamens numerous (35 -37 or more), different in size; filaments longer than anthers; anthers ca 1.5 mm long, slightly apiculate, pilose; Ovary 2 -3-celled, many ovules in each loculus with axile placentation; styles 2 -3 fid. Fruit globose, berry, crowned by persistent style.
181	<i>Pyrenaria khasiana</i> R.N. Paul	THEACEAE	Indeterminate	Endemic to Meghalaya.		Shrubs, stem glabrous, bark brown or brownish grey. Leaves oblanceolate to spatulate, apex abruptly short acuminate, base acute or attenuate, margin serrate, entire towards the base, 15-21x4-7cm, glabrous, coriaceous, midvein depressed above, raised below; petioles 4- 7 mm long, glabrous. Flower not seen. Fruit globoid, 1.6-2.5 cm across, furrowed longitudinally, hard, apex with 5 stigmatic heads, base with persistent sepals.
182	<i>Cissus spectabilis</i> (Kurz) Planchon	VITACEAE	Endangered	Endemic to Sikkim and W. Bengal.		Erect shrubs; branches upright, striate, soft-pubescent. Leaves subsessile to petiolate, 13- 20 x 13- 20 cm, broad-ovate, rhomboid or suborbicular, shallowly cordate at base, margins dentate-serrate, acute at apex; petioles usually up to 1 cm long. Inflorescences divaricate cymes, pubescent, ca 6 cm long; peduncles ca 3 cm long. flowers 4-merous, ca 1.5 mm long; pedicels 2- 3 mm long. Calyx saucer-shaped, obscurely 4-lobed. Petals ca 1.5 X 0.7 mm, oblong-ovate, acute and hooded at apex. Stamens ea 1 mm long ; anthers globose. Disc 4-notched, covering the ovary. Ovary ca 1 mm across; style stout, ca 1 mm long; stigma minute.

183	<i>Christella clarkei</i> (Bedd.) Holt.	THELYPTERIDACEAE	Vulnerable	According to Holtum (1977) it is only known from type collection (Darjeeling 400m.); Clarke (1880) and Beddome (1883), mentioned the locality from Sikkim Himalaya near Darjeeling	Due to habitat destruction and narrow endemism.	Rhizome short-creeping. Fronds 75-100x25-30 cm; stipe and rachis hairy; lamina pinnate, pinnae reduced in the basal part into auricles, alternate, middle pinnae 17-20x4-5cm, narrowed at the base, herbaceous in texture, margins lobed, 1-2 mm from costa. Veins upto 16 pairs, simple to one or two times forked, basal vein joining with more than one excurrent veins to sinus, veins anastomosing to form areoles along costules, hairy on the lower surface. Sori indusiate on basal veins only; indusia hairy.
184	<i>Christella kaumaunica</i> Holt.	THELYPTERIDACEAE	Vulnerable	Endemic to Kumaun; so far known only from the type specimen.	due to habitat loss	Rhizome creeping; fronds distant, 80- 100 cm high; stipes upto 32 cm long, clothed with short hairs; pinnae ca 30 pairs, basal 5-6 pinnae reduced into lobate auricles, margins crenate, middle pinnae 16- 18 x 2- 2.5 cm, auriculate, caudate acuminate at apex, both the surfaces clothed with short erect hairs; veins 10 –11-paired, anastomosing, herbaceous in texture. Sori medial, divergent; indusium small with acicular hairs.
185	<i>Coryphopteris didymochlaenoides</i> (Clarke) Holt.	THELYPTERIDACEAE	Rare	Meghalaya-Khasi hills; endemic.	It is a case of narrow endemism.	Rhizomes suberect; fronds tufted, stipes 30 -50 cm long, pubescent; lamina lanceolate, 25-40 x 10-20 cm, leathery in texture; margin lobed, lobes cut down upto 2/3rd or more towards the costa, hairy on the lower surface; veins simple. Fertile fronds larger and slightly contracted in comparison of sterile ones; sori indusiate, larger, confined to basal part, didymochlaenoid, close to midrib; indusium long, hairy; sporangia sessile, without hairs or glands.
186	<i>Cyclogramma squaniaestipes</i> (Clarke) Tagawa	THELYPTERIDACEAE	Rare	Sikkim-Simonbong at 1500m altitude. Endemic.	due to habitat loss	Rhizome short-creeping; fronds distant, 70-150cm high; stipes and rachis pubescent. Lamina lanceolate, pinnae sub-opposite in the basal part, middle pinnae 15-17x1.5-2cm, pubescent on both the surfaces, margins lobed, lobes deeply cut down near to costa, oblong to acute, herbaceous but firm in texture. Sori near the midrib.

187	<i>Metathelypteris decipiens</i> (Clarke) Ching	THELYPTERIDACEAE	Rare	Darjeeling Himalaya and Khasia Hills. Endemic.	decline of its habitas is a causative factor for its rarity.	Rhizome short, erect; fronds tufted, clefted; stipes 10-30cm long, stramineous hairy; lamina deltoid-oblong, 30-40x10-16 cm, pinnate; pinnae 10-15 pairs, the basal pairs close, largest 8-9x2-2.5 cm. broadly ovate-lanceolate, margins serrate, veins 6 pairs, forked, herbaceous in texture, hairy on both the surfaces. Sori medial on the veins; indusium small, pubescent.
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