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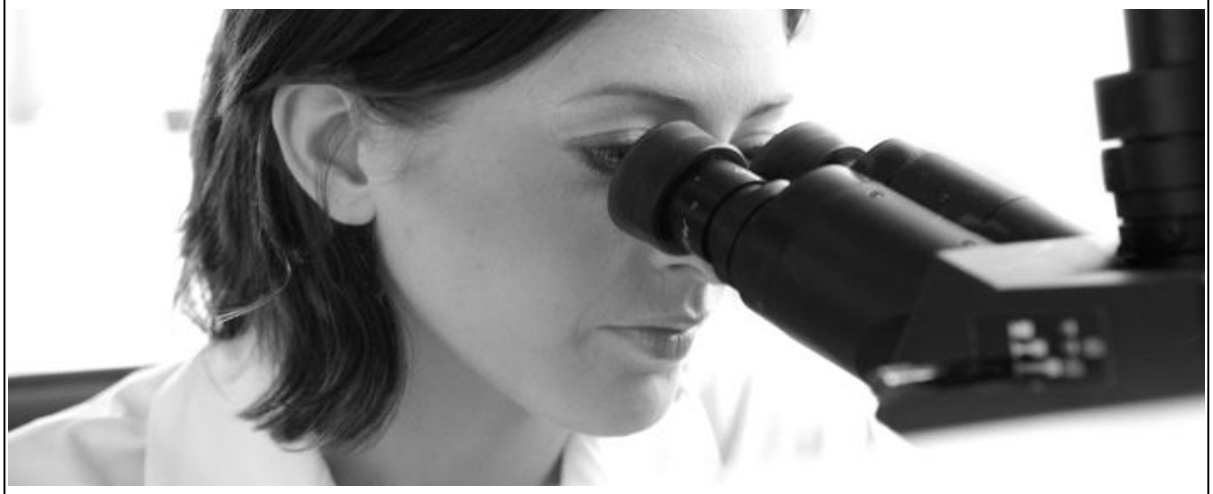

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RESEARCH ARTICLE

VASCULAR PLANT DISTRIBUTION IN AN ENDANGERED FRAGILE ECOSYSTEM OF SHERVARAYAN HILLS, EASTERN GHATS OF INDIA

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ABSTRACT

The rapid decline of world's tropical forest is one of today's pressing global environmental problems. One of the major threats to tropical forest biodiversity is habitat loss leading to depletion and the concomitant loss of forest cover. The biodiversity components of the Shervarayan hills as a whole are endangered owing to mining activities. Species base line information is required for this ecosystem to plan for any forest conservation program. Thus the present study is focused on the list of vascular species, habitats and their Red listed status of an endangered fragile Shola vegetation found in and around bauxite mining in Shervarayan hills, Eastern Ghats of Tamil Nadu. From the present study 225 species of vascular plants are reported, among them about 24 species are Pteridophytes, One Gymnosperm and 210 Angiosperms.

INTRODUCTION

Mining and industrialization play an important role in national economy often at the cost of nature. Mining alone causes extensive and irreversible damages to the ecosystem and one such damage is the wanton clearing of vegetation and the subsequent degradation of land (Pant *et al.*, 1999). To prioritize areas for conservation, biologists and managers need information on species diversity in threatened habitats. The resources available for such inventories remain severely limited, and therefore there is a demanding need to develop faster ways to estimate the status of target habitats (Kerr *et al*., 2000).

The largest and most dominant organisms of late-successional and old-growth forest ecosystem are the vascular plants, which may tower over 300 feet, with lifespans over 1000 years. They create the structure of the forest and function as the primary producers, ranging from conifers to delicate ferns. Many of these are symbiotic with mycorrhizal fungi and other vascular plants (eg. Mycotrophic ericads and orchids) and others fix nitrogen (eg., alder, ceanothus, members of the pea family). These trees provide nesting and denning habitat for a wide range of birds and mammals. When these trees fall, they provide habitat for invertebrates, lichens, mosses, fungi, amphibians and small mammals. Most of these vascular plants also have close relationships with specific animal pollinators and seed dispersers. Such, vascular plant species richness is one of the important ecosystem characteristics (Hooper and Vitousek, 1997; Tilman *et al.*, 1997), and the first step in working with species of special conservation status starts with determination of the species that have been reported for the area (Shultz *et al.*, 1998). Data from inventory and monitoring are essential for identifying key issues for policy and management goals and thus biodiversity inventory can be used for prioritizing conservation (Suman Sahai, 2000). There are studies on conservation status of vascular plants in Madagascar (Portal *et al*, 2009), Russian coal mining station (Ivakina *et al*,

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2013). In this study vascular plants distribution in fragile vegetation around the Bauxite mining area of Shervarayan Hills were focused.

MATERIALS AND METHODS

Study Area

The Shervarayan hills are segments of the Eastern Ghats which are located in the northern part of Salem district, Tamil Nadu, South India and occupy an area of 469.9 km^2. The study area lies between latitudes 11° 43' 00" to 12° 00' 00" N and longitudes of 78° 00' 00" to 78° 22' 30" E (Map 1) and falls in the Survey of India toposheets (SOI) 58I/1, 2, 5 and 6 at the scale of 1: 50,000. The mean annual rainfall at the upper and the foothills are respectively 1638 mm and 850 mm. The temperature ranges from 13 °C to 29 °C on the hill peaks and to 25 °C and 40 °C at the foothills.

The soil is red loamy and lateritic. The area is made up of Archaean crystalline rock like amphibolites, lepttnites, garnetiferous granites and charnockites. Bauxite and Magnesite are the chief mineral resources in the Shervarayan hills. There are 71 villages, which are administrated by two taluks namely Yercaud and Omalur of which 67 villages come under Yercaud Taluk and rest are in Omalur Taluk. In Shervarayan Hills Bauxide ore are mined from the Plateau Region, Which is not protected under Reserve Forest. This mining area is surrounded by Wet Evergreen vegetation that affected by mining activities. This pristine ecosystem has rich plant species diversity, hence the present study focused on to study the plant diversity around the mining regions.

METHODOLOGY

Periodical visits to the mining and adjoining areas were undertaken from 1999 onwards and plant specimens were collected and processed according to standard herbarium procedures and duly identified.

Difficult specimens were identified at the Botanical Survey of India, Southern Circle, Coimbatore and Rapinat Herbarium, St. Joseph's College, Tiruchirappali. Angiosperm taxa were classified following Bentham and Hooker's system of classification and pteridophytes based on Manickam and Irudayaraj (1992). The herbarium specimens have been deposited in Rapinat Herbarium, St. Joseph's College, Tiruchirappali.

RESULTS AND DISCUSSION

From the present study 226 species of vascular plants are reported, belonging to 186 genera of 83 families. Among them about 24 species are Pteridophytes in 21 genera of 19 families and one gymnosperm species.

The angiosperms dominate with 201 species in 166 genera of 63 families. Family-wise *Poaceae* (29 species) is the highest contributor followed by *Papilionoideae (s.f.)* (16 species), *Orchidaceae* (13 species), *Rubiaceae* (12 species), *Cyperaceae* (11 species), *Asteraceae* (9 species), *Euphorbiaceae* (9 species) and *Lauraceae* (7 species). These eight dominant families comprise 106 (47.11%) species. 30 families are monotypic and 39 families are monogeneric. From 238 vascular plant species 14 species are under rare/endangered categories.

The checklist of vascular plant species, habitats, herbarium sheet number, Red list status shown below

Family	Species name	Habitat	CNRS NO.	ST.
	Pteridophytes			
Psilotaceae	*Psilotum nudum* (L.) P.Beauv.	Epiphyte	30598	[1]R
Ophioglossaceae	*Botrychium daucifolium* Wall.	Terrestrial	20241	[2]R
Marattiaceae	*Marattia fraxinea* Sm.	Terrestrial	20225	[2]R
Gleicheniaceae	*Dicranopteris linearis* (Burm.f.) Underwood var. *sebastiana* Panigrahi & Dixit	Terrestrial	30574	[2]Vu
Schizaeaceae	*Anemia wightiana* Gardner	Terrestrial	20217	
Pteridaceae	*Pteris quadriaurita* Retz.	Terrestrial	20220,20712,20746	
Sinopteridaceae	*Doryopteris concolor* (Land. et C.E.C.Fisch.) Kuhn	Terrestrial	20224	
Heminoitidaceae	*Hemionitis arifolia* (Burm.f.) T.Moore	Terrestrial	20235	
Adiantaceae	*Adiantum capillus-veneris* L.	Terrestrial	20216	
Dennstaedtiaceae	*Pteridium accruilinum* (L.) Kuhn	Terrestrial	20721	
Lindsaeaceae	*Odontosoria chinensis* (L.) J.Smith	Terrestrial	20206	
Cyatheaceae	*Cyathea nilgirensis* Holttum	Tree		[2]NT
Oleandraceae	*Nephrolepis auriculata* (L.) Trimen	Epiphyte or Lithophyte	20271,20280,30541	
Thelypteridaceae	*Pseudophegopteris pyrrhorhachis* (Kunze) Ching	Terrestrial	20277	
Aspleniaceae	*Asplenium aethiopicum* (Burm.f.) Becherer	Terrestrial	20706	
	A .decrescens Kunze	Terrestrial	30518	
	A .laciniatum Don	Epiphyte	20746	
	A. polyodon G.Forst.	Terrestrial	20240	
Athyriaceae	*Athyrium lanceum* (Kunze) T.Moore	Terrestrial	20228	
Lomariopsidaceae	*Elaphoglossum stelligerum* (Wall. ex Baker) T.Moore ex Alston & Bonner	Terrestrial	30574	
Blechnaceae	*Blechnum orientale* L.	Terrestrial	20204,20226,20735	
Polypodiaceae	*Lepisorus nidus* (Hook.) Ching	Epiphyte	30543	
	Microsorium pteropus (Bl.) Copel.	Epiphyte	30470,30582	
	Pyrrosia porosa Hovenkamp var. *porosa*	Lithophyte	20212	
	Gymnosperms			
Pinaceae	**Pinus roxburghii* Sarg.	Tree		

	Angiosperms			
Ranunculaceae	*Ranunculus wallichianus* Wight & Arn.	Climber	20277	
Magnoliaceae	*Michelia champaca* L.	Tree	30504	[3]Lc
Polygalaceae	*Polygala erioptera* DC.	Herb	20255	
	P. rosmarinifolia Wight & Arn.	Herb	30513	
Theaceae	*Eurya nitida* Korth	Tree	20286,20278, 20700,20758	
Malvaceae	*Sida rhombifolia* L.	Subshrub	30516	
Sterculiaceae	*Waltheria indica* L.	Subshrub	30544	
Tiliaceae	*Triumfetta rhomboidea* Jacq.	Subshrub	20702,20717	
	T. pilosa Roth	Subshrub	20730	
Elaeocarpaceae	*Elaeocarpus serratus* L.	Tree	20698	
Oxalidaceae	*Biophytum sensitivum* (L.) DC.	Herb	30579	
	Oxalis corniculata L.	Herb	30552	
Balsaminaceae	*Impatiens acaulis* Arn.	Subshrub	20245	[4]En
Rutaceae	*Toddalia asiatica* (L.) Lam. var. *gracilis* Gamble	Liane	20747	
Malpighiaceae	*Hiptage benghalensis* (L.) Kurz	Liane	20282	
Meliaceae	*Cipadessa baccifera* (Roth) Miq.	Shrub	20699	
	Toona ciliata M.Roem. ssp. *ciliata* var. *ciliata*	Tree	20775	
Celastraceae	*Celastrus paniculatus* Willd.	Liane	30506	[8]Vu
	Maytenus ovata (Wight & Arn.) Loesener	Shrub	20726	
Rhamnaceae	*Zizyphus rugosa* Lam.	Shrub	20724	
Sapindaceae	*Dodonaea viscosa* Jacq. var. *angustifolia* (L.f.) Benth.	Shrub	20701	
Papilionoideae	*Atylosia albicans* (Wight & Arn.) Benth.	Subshrub	20760	
(*s.f*)	*A. rugosa* Wight & Arn.	Subshrub	30538	
	Crotalaria micans Link	Subshrub	20774	
	C. umbellata Wight ex Wight & Arn.	Subshrub	20256	
	Desmodium ferrugineum Wall. ex Thwaites	Subshrub	20233	[6]R
	D. heterocarpon (L.) DC.	Subshrub	30591	
	D. triflorum (L.) DC.	Subshrub	30551	
	Flemingia grahamiana Wight & Arn.	Subshrub	30507	
	F. macrophylla (Willd.) Prain ex Merr.	Subshrub	20218	
	Indigofera tinctoria L.	Subshrub	20762, 30523	
	Macrotyloma uniflorum (Lam.) Verdc.	Subshrub	20200	
	Mundulea sericea (Willd.) A. Chev.	Subshrub	20729, 20749	
	Rhynchosia densiflora (Roth) DC.	Vine	30557	
	Shuteria involucrata (Wall.) Wight & Arn.	Subshrub	30235	
	Tephrosia tinctoria Pers.	Subshrub	20265, 30572	
	Zornia diphylla (L.) Pers.	Herb	30548	
Caesalpinioideae (*s.f*)	*Chamaecrista mimosoides* (L.) Greene	Herb	20266	
Mimosoideae (*s.f*)	*Acacia mearnsii* De Wild.	Tree	20244	
Rosaceae	*Rubus ellipticus* Sm.	Climber	30502	
Crassulaceae	*Kalanchoe floribunda* Wight & Arn.	Herb	30561	
Droseraceae	*Drosera peltata* Thunb.	Herb	20224	
Combretaceae	*Terminalia chebula* Retz.	Tree	30572	
Myrtaceae	*Eucalyptus* sp.	Tree	30588	
	Syzygium cumini (L.) Skeels	Tree	20238	
	S. jambos (L.) Alston	Tree	20222, 30588	
Melastomataceae	*Memecylon edule* Roxb. var. *edule*	Tree	30536	
	M. umbellatum Burm.f.	Shrub	20708,20731, 30546	
Onagraceae	*Oenothera rosea* L'Hér. ex Aiton	Herb	20738, 20768	
Passifloraceae	*Passiflora edulis* Sims	Climber	20722, 30515	
	P. subpeltata Ortega	Climber	30503	
	Zehneria scabra (L.f.) Sonder	Climber	30501	
Umbelliferae	*Bupleurum distichophyllum* Wight & Arn.	Herb	20229	
Caprifoliaceae	*Viburnum punctatum* Buch.-Ham. ex D.Don	Tree	20766	
Rubiaceae	*Coffea arabica* L.	Shrub	20210	
	Knoxia mollis R.Br. ex Wight & Arn.	Subshrub	30533	
	Morinda umbellata L.	Liane	30539	
	Mussaenda hirsutissima (Hook.f.) Hutch. ex Gamble	Shrub	20740	
	Oldenlandia herbacea (L.) Roxb.	Herb	30542	
	Psychotria elongata (Wight) Hook.f.	Shrub	20203,20711, 20756, 20285	
	Psydrax dicoccos Gaertn.	Tree	20283	
	Randia brandisii Gamble	Shrub	30540	
	Rubia cordifolia L.	Vine	20745	[5]CE
	Spermacoce ocymoides Burm.f.	Herb	20742, 30512	
	Tarenna asiatica (L.) Kuntze ex K.Schum.	Shrub	30560	
	Wendlandia thyrsoidea (Roem. & Schult.) Steud.	Shrub	20275	
Asteraceae	*Adenostemma lavenia* (L.) Kuntze	Shrub	30510	
	Anaphalis lawii (Hook.f.) Gamble	Subshrub	20725	
	Bidens pilosa L.	Herb	20723, 20744	
	Conyza bonariensis (L.) Cronquist	Herb	20728	

	***Emilia sonchifolia* (L.) DC.**	**Subshrub**	**20276**	
	Erigeron karvinskianus DC.	Subshrub	20284	
	Glossocardia bosvallea (L.f.) DC.	Herb	20744	
	Gynura nitida DC.	Herb	30519	
	Vernonia arborea Buch-Ham.	Tree	20207,30238,30511	
Myrsinaceae	*Ardisia solanacea* Roxb.	Shrub	23232	
	Embelia ribes Burm.f.	Straggler	30236	
	E .tseriam-cottam (Roem. & Schult.) A.DC.	Shrub	20709,20777	
	Maesa indica (Roxb.) A.DC.	Shrub	20223	
	Myrsine capitellata Wall.	Tree	20279,20705	
Symplocaceae	*Symplocos cochinchinensis* (Lour.) S.Moore ssp. *laurina* (Retz.) Nooteb. var. *laurina*	Tree	20287,20288,20707	
Oleaceae	*Chionanthus mala-elengi* (Dennst.) P.S. Green ssp. *mala-elengi*	Tree	30556	
	Jasminum angustifolium (L.) Willd. var. *sessiliflorum* (Vahl) P.S. Green	Climber	20239	
	J. cuspidatum Rottler	Climber	20234,20739	
	J. sambac (L.) Aiton	Climber	302387	
	Ligustrum gamblei T.P.Ramamoorthy	Tree	30584	
	L. perrottetii A.DC.	Tree	20213,20281	
Convolvulaceae	*Evolvulus alsinoides* (L.) L.	Herb	30545	
	Ipomoea indica (Burm.f.) Merr.	Climber	30589	
Solanaceae	*Datura innoxia* Mill.	Subshrub	20769	
	Physalis peruviana L.	Subshrub	30514	
	Solanum giganteum Jacq.	Shrub	30529	
	S. nigrum L.	Shrub	20779	
	S. violaceum Ortega	Subshrub	20776,30520	
Scrophulariaceae	*Lindernia hyssopioides* (L.) Haines	Herb	20268	
	Striga asiatica (L.) Kuntze	Herb	20247,20743	
Bignoniaceae	*Jacaranda mimosifolia* D.Don	Tree	30521	
Acanthaceae	*Andrographis lineata* Wall. ex Nees	Subshrub	30596	
	Justicia simplex D.Don	Herb	20262,30587	
	Stenosiphonium parviflorum T. Anderson	Subshrub	30239	
	Strobilanthes kunthiana (Nees) T. Anderson ex Benth.	Shrub	20257	
	S. pulneyensis C.B.Clarke	Shrub	30528	
Verbenaceae	*Cleodendrum serratum* (L.) Moon	Shrub	20732	
	Lippia javanica (Burm.f.) Spreng.	Herb	20704	
	Stachytarpheta mutabilis (Jacq.) Vahl	Herb	20733	
	Verbena rigida Spreng.	Herb	20727,30571	
Labiatae	*Anisochilus scaber* Benth.	Herb	20778	
	Leucas vestita Benth.	Herb	30522	
	Plectranthus deccanicus Briq.	Herb	20767	
Polygonaceae	*Persicaria chinensis* (L.) H.Gross	Herb	20734	
Piperaceae	*Peperomia tetraphylla* (G.Forst.) Hook. & Arn.	Epiphyte	20230	
	Piper hymenophyllum Miq.	Epiphyte	20750	
Myristicaceae	*Myristica dactyloides* Gaertn.	Tree	20715	
Lauraceae	*Beilschmiedia bourdillonii* Brandis	Tree	20202	
	Cinnamomum macrocarpum Hook.f.	Shrub	30509	[4]R
	Litsea deccanensis Gamble	Tree	30526	
	Neolitsea scrobiculata (Meisn.) Gamble	Tree	20718,2075130508	
	N. zeylanica (Nees) Merr.	Tree	30234	
	Persea macrantha (Nees) Kosterm.	Tree	20719	
	Phoebe wightii Meisn.	Tree	30505	
Elaeagnaceae	*Elaeagnus indica* Servett.	Linae	20734	
Santalaceae	*Santalum album* L.	Tree	30583	
Balanophoraceae	*Balanophora fungosa* J.R. Forst. & G. Forst. ssp. *indica* (Arn.) B. Hansen var. *indica*	Herb	20678	
Euphorbiaceae	*Agrostistachys indica* Dalzell	Tree	20755	
	Bischofia javanica Blume	Tree	20757	
	Breynia retusa (Dennst.) Alston	Subshrub	20208	
	Bridelia crenulata Roxb.	Tree	20752	
	Glochidion ellipticum Wight	Tree	20753,30517	
	Macaranga peltata (Roxb.) Müll. Arg.	Tree	20215	
	Mallotus tetracoccus (Roxb.) Kurz	Tree	20713	
	Phyllanthus emblica L.	Tree	30535	
	P. virgatus G. Forst.	Herb	30578	
Daphniphyllaceae	*Daphniphyllum neilgherrense* (Wight) K.Rosenthal	Tree	20710,20720, 20737,30525	
Ulmaceae	*Trema orientalis* (L.) Blume	Tree	30555	
Moraceae	*Artocarpus heterophyllus* Lam.	Tree	20221	
Orchidaceae	*Acanthephippium bicolor* Lindl.	Epiphyte	20695	
	Aerides ringens (Lindl.) C.E.C.Fisch.	Epiphyte	20690	
	Dendrobium macrostachyum Lindl.	Epiphyte	693,20685, 20691	

	***Diplocentrum recurvum* Lindl.**	**Epiphyte**	**20772**	
	Gastrochilus acaulis (Lindl.) Kuntze	Epiphyte	20681,20692	
	Habenaria decipiens Wight	Terrestrial	20697	
	H. longicorniculata J.Graham	Terrestrial	20687	
	H. pallideviridis Seidenf.	Terrestrial	20688	
	H. rariflora A.Rich.	Terrestrial	20689	
	Luisia birchea Blume	Epiphyte	20682,20683	En
	L. zeylanica Lindl.	Epiphyte	20684	
	Polystachya concreta (Jacq.) Garay & H.R.Sweet	Epiphyte	20694,20686	R
	Seidenfia rheedii (Sw.) Szlach.	Terrestrial	20714,30773	
Zingiberaceae	*Curcuma neilgherrensis* Wight	Herb	20249	
Smilacaceae	*Smilax zeylanica* L.	Climber	20219,20211	
Haemodoraceae	*Ophiopogon intermedius* D.Don	Herb	30532	
Liliaceae	*Chlorophytum malabaricum* Baker	Herb	30531	
Commelinaceae	*Commelina clavata* C.B.Clarke	Herb	30240	
	Cyanotis cristata (L.) D.Don	Herb	20273,20696	
	C. pilosa Schult.f.	Herb	30550	
	Murdannia dimorpha (Dalzell) G.Brückn.	Herb	20251	
	M. nudiflora (L.) Brenan	Herb	30593	
Juncaceae	*Juncus leschenaultii* J.Gay ex Laharpe	Herb	30590	
Palmae	*Phoenix loureirii* Kunth var. *humilis* (Becc.) S.C.Barrow	Shrub	30524	
Araceae	*Arisaema leschenaultii* Blume	Herb	20716	
	Eriocaulon cinereum R.Br.	Herb	30585	
Cyperaceae	*Carex herbacea* C.A.May ssp. *ligulata* (Nees) T.Koyama	Herb	30500	
	C. myosurus Nees	Herb	30534	
	Cyperus compressus L.	Herb	30568	
	C. distans L.	Herb	30569	
	Fimbristylis schoenoides (Retz.) Vahl	Herb	20267,20269,30581	
	F. sieberiana Kunth	Herb	30567	
	Kyllinga brevifolia Rottb.	Herb	30570	
	K. bulbosa P.Beauv.	Herb	30564	
	Mariscus squarrosus (L.) C.B. Clarke	Herb	30594	
	M. sumatrensis (Retz.) A.Raynal	Herb	30576	
	Scleria terrestris (L.) Fassett	Herb	20209	
Poaceae	*Arundinella setosa* Trin.	Herb	30527,30563	
	Bothriochloa pseudoischaemum (Steud.) Henrard	Herb	30569	
	Brachiaria semiundulata (Hochst.) Stapf	Herb	20256	
	Briza minor L.	Herb	20263	
	Centotheca lappacea (L.) Desv.	Herb	30506	
	Chrysopogon orientalis (Desv.) A. Camus	Herb	20703,20271	
	C. serrulatus Trin.	Herb	20242,20264,20274	
	Cyrtococcum trigonum (Retz.) A. Camus	Herb	30530	
	Dichanthium annulatum (Forssk.) Stapf	Herb	202502	
	Echinochloa picta (J.König) Michael	Herb	20272	
	Eleusine indica (L.) Gaertn.	Herb	30559,30595	
	Eragrostis nutans (Retz.) Nees ex Steud.	Herb	20253	
	E. tenuifolia Hochst. ex Steud.	Herb	30597	
	Eulalia wightii (Hook.f.) Bor	Herb	20246	
	Heteropogon fischerianus Bor	Herb	20260	
	Isachne deccanensis Bor	Herb	20765	
	I. kunthiana (Steud.) Miq.	Herb	30549	
	I. miliacea Roth	Herb	30537	
	Ischaemum commutatum Hackel	Herb	30599	
	Oplismenus compositus (L.) P. Beauv.	Herb	20231, 20254	
	Panicum notatum Retz.	Herb	20759	
	Paspalum longifolium Roxb.	Herb	20761	
	Pennisetum hohenackeri Hochst. ex Steud.	Herb	20761	
	Rhynchelytrum repens (Willd.) C.E. Hubb.	Herb	20248	
	Setaria palmifolia (J.König) Stapf	Herb	20754	
	S. pumila (Poir.) Roem. & Schult.	Herb	20259	
	Sporobolus maderaspatanus Bor	Herb	20763	
	Themeda triandra Forssk.	Herb	20201	
	Tripogon narayanii Sreek. *et al.*	Herb	20250,20270	

** specimen noted in the field
s.f : Sub Family
CE: Critically Endangered; En: Endangered; Vu: Vulnerable; R: Rare ;
Lr/Lt : Lower Risk, Least Threatened

All the orchids are categorized under CITES (Convention on International Trade in Endangered species of wild fauna and flora) to regulate and monitor the international trade of these plants species.

These vascular plants gain importance as they are connected with all trophic levels of the food chain, **w**hich facilitate gene flow through pollen and seed dispersal, and provide a food source for animal vectors. Whereas many vascular plants colonize habitat quickly and have short reproductive cycles

most species closely associated with late successional and old growth forests are long lived perennials. Many woody and herbaceous vascular plants are extremely long lived and decades may be required before plants reach reproductive size (Hanzawa and Kalisz 1993). Hence, the impact of mining on these perennials might be irreversible which can lead to the destruction of the entire ecosystem. Recolonization of these disturbed areas and establishment has to be evaluated, but may be slow particularly for species with limited dispersal and special requirements.

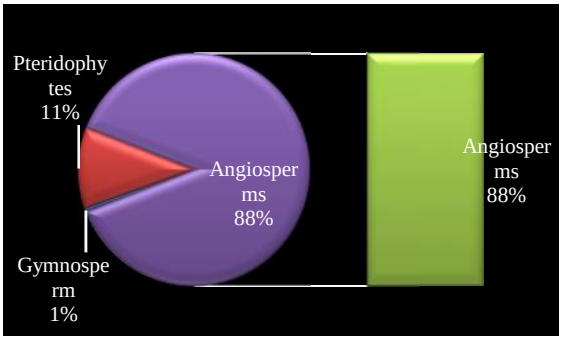


Figure 1 Contribution of species by different Taxa

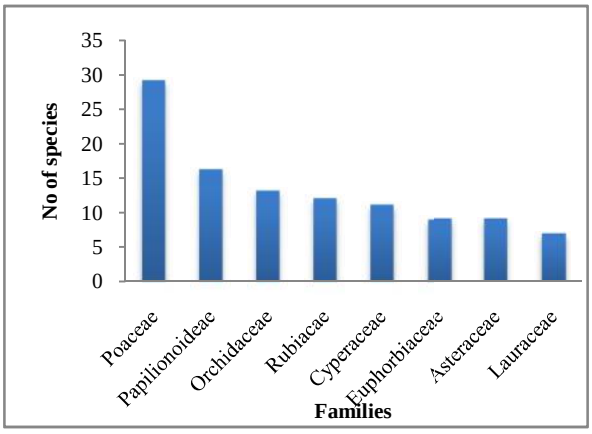
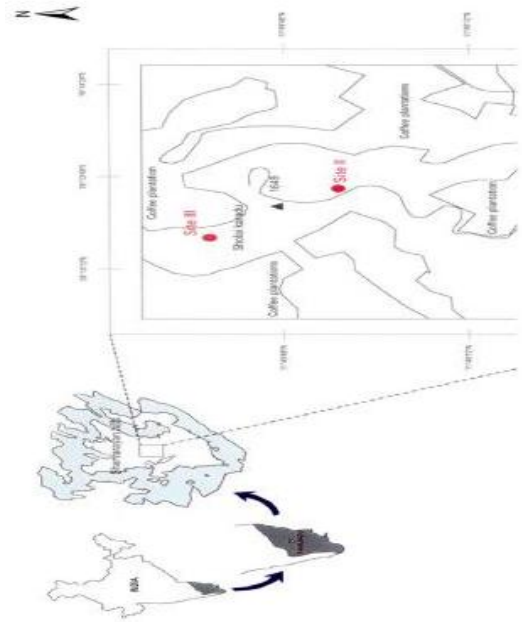


Figure 2 Contribution of species by different families in Angiosperms



Map 1 Map showing Study Area of Shervarayan hills, Eastern ghats, India

In addition to their vital role in maintaining a functioning forest ecosystem, vascular plants provide important commercial resources, including timber and other special forest products. Hence, this study gains importance as this provides a baseline data to restore a disturbed ecosystem with its vital players.

CONCLUSION

The mining activities are occurring in three different localities, but due to the immature state of bauxite the mining activities had been stopped in certain regions. Inspite of the cessation, the impact of the mining activities had already disturbed the ecosystem to a state of fragile evergreen vegetation. The present study reveals, that the shola of these hills with evergreen vegetation is distinctive and prominent with diversified species. To conserve these vital species of the ecosystem, we recommend the inclusion of these site within the protected areas to maximize protection and thus to conserve these species for the efficient functioning of forest ecosystem.

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