



## TREE SPECIES DIVERSITY IN THE EASTERN GHATS OF NORTHERN ANDHRA PRADESH, INDIA

M. Tarakeswara Naidu<sup>1</sup> & O. Aniel Kumar<sup>2</sup>

ISSN 0974-7907 (Online)  
ISSN 0974-7893 (Print)

<sup>1,2</sup> Department of Botany, Andhra University, Visakhapatnam, Andhra Pradesh 530003, India  
<sup>1</sup> tarakeswaranaidu@gmail.com (corresponding author), <sup>2</sup> oak.aniel@gmail.com

OPEN ACCESS

**Abstract:** The present study was conducted to analyze tree species diversity in the tropical forests of the Eastern Ghats of northern Andhra Pradesh, India. A total of 270 species of trees ( $\geq 15$  cm girth at breast height) pertaining to 177 genera belonging to 55 families were recorded. Among the 270 species, 141 species were observed to be common, 78 were occasional and 51 species were rare in the study area. Fabaceae was the dominant family with 33 species followed by Rubiaceae with 15 species and Malvaceae, Moraceae and Phyllanthaceae with 13 species each. The genera with the highest number of species include *Ficus* (12 species), *Diospyros* (8 species), *Albizia* and *Grewia* (6 species each), *Acacia* and *Bauhinia* (5 species each). Forty-five percent of the species were indigenous. This illustrates the diversity of the tree species in the studied area of the Eastern Ghats and also emphasizes the need for their conservation.

**Keywords:** Andhra Pradesh, Eastern Ghats, India, tree diversity, tropical forests, vegetation.

### Telugu Abstract:

ప్రస్తుత అధ్యయనం ఉత్తర ఆంధ్ర ప్రదేశ్ యొక్క తూర్పు కనుమల ఉష్ణమండల అడవులలో వృక్ష జాతులు వైవిధ్యం విశ్లేషించడానికి నిర్వహించడము జరిగినది. 55 కుటుంబాలకు చెందిన 177 ప్రజాతులకు సంబంధించిన మరియు 270 చెట్ల జాతులు మొత్తం ( $\geq 15$  సె.మీ. రొమ్ము ఎత్తులో) నమోదయ్యాయి. 270 జాతులలో, 141 జాతులు సాధారణంగా, 78 అప్పుడప్పుడు మరియు 51 జాతులు అరుదైనవిగా అధ్యయన ప్రాంతంలో పరిశీలించడము జరిగింది. ఫాబీసి 33 జాతులతో పాటు రూబియేసి, మాల్వేసి, మోరేసి 15 జాతులు చొప్పున మరియు ఫిల్లాంటేసి 13 జాతులు అధిపత్య కుటుంబాలుగా ఉన్నాయి. ఫైకస్ (12 జాతులు) ప్రజాతి అగ్రభాగాన మరియు తరువాత క్రమములో డయోస్పిరాస్ (8 జాతులు), ఆల్బీజియా మరియు గ్రీవియా (6 జాతుల చొప్పున), అకేషియా మరియు బాహినియా (5 జాతులు చొప్పున) ప్రజాతులు అత్యధిక సంఖ్యలో ఉన్నాయి. నలభై ఐదు శాతం జాతులు స్వదేశీ మూలవాసులు. తూర్పు కనుమల అధ్యయన ప్రాంతంలో చెట్ల జాతుల వైవిధ్యమును వివరిస్తూ మరియు వాటి సంరక్షణ అవసరాన్ని నొక్కి చెబుతుంది.



DOI: <http://dx.doi.org/10.11609/JoTT.o3764.7443-59>

Editor: Vijayasankar Raman, University of Mississippi, USA.

Date of publication: 26 June 2015 (online & print)

Manuscript details: Ms # o3764 | Received 10 September 2013 | Final received 30 May 2015 | Finally accepted 03 June 2015

Citation: Naidu, M.T. & O.A. Kumar (2015). Tree species diversity in the Eastern Ghats of northern Andhra Pradesh, India. *Journal of Threatened Taxa* 7(8): 7443–7459; <http://dx.doi.org/10.11609/JoTT.o3764.7443-59>

Copyright: © Naidu & Kumar 2015. Creative Commons Attribution 4.0 International License. JoTT allows unrestricted use of this article in any medium, reproduction and distribution by providing adequate credit to the authors and the source of publication.

Funding: Department of Biotechnology (DBT), Government of India, New Delhi

Competing interests: The authors declare no competing interests.

Author Contribution: OAK involved in the plan of work, conducted field work and compiled the manuscript. MTN did field work, compiled the field observations and results reported in the paper.

Author Details: M. Tarakeswara Naidu is former Research Fellow in Botany, Andhra University, Visakhapatnam. He worked on systematics, ecology, diversity of plants in Eastern Ghats region. Prof. O. Aniel Kumar is Head of the department of Botany, Andhra University, Visakhapatnam. His field of research interests includes Molecular Biology, Cytogenetics, Ecology and Systematics.

Acknowledgements: We are thankful to the Department of Biotechnology, Government of India for financial support, and to the staff of Andhra Pradesh State Forest Department for their co-operation during the field surveys.



## INTRODUCTION

Trees are the most valuable natural resources that have an immense importance both to living organisms and to derive economy to the country. Trees form the major structural and functional basis of tropical forest ecosystems and can serve as robust indicators of changes at the landscape scale (Sandhyarani et al. 2007; Sahu et al. 2012). A tree is a woody plant that reaches a minimum height of at least 3m having a single stem with a definite crown shape (Lawrence 1951). Trees are the largest and long lived static organisms often with an amazing diversity of forms. Trees comprising the forest cover, serve as a substrate for millions of microbes, herbs, shrubs, climbers and diverse fauna. They provide basic needs to humans in the form of oxygen, food, timber, paper, fuel wood and medicine (Premavani et al. 2014). Trees bind the soil, recycle minerals and regulate the course of rain water.

Tropical forests are the most complex of all the terrestrial ecosystems and generate a variety of natural resources help to sustain the livelihood of local communities (Kumar & Bhatt 2006). These forests are rich in medicinal and economically important plants. Tropical forests are disappearing at alarming rates owing to deforestation for extraction of timber, shifting cultivation and collection of non-timber forest products (NTFPs) (Raghubanshi & Tripathi 2009; Pragasan & Parthasarathy 2010). Tropical trees are interesting

subjects because of their rich species diversity ( $\alpha$ -diversity) (Chittibabu & Parthasarathy 2000). Tropical forests cover 7% of the earth's land surface, but harbor more than half of the world's species (Wilson 1988) and are currently disappearing at an overall rate of 0.8-2% per annum (May & Stumpf 2000; Sagar et al. 2003). Forests in the peninsular India are degrading at an alarming rate (Reddy et al. 2007), which is largely associated with anthropogenic activities and economic problems. The Eastern Ghats of India is a broken chain of hills that runs almost parallel to the east coast of India covering four states: viz., Odisha, Andhra Pradesh, Tamil Nadu and Karnataka. The Eastern Ghats is one of the rich biodiversity regions in India, affected by heavy anthropogenic pressures. The present study deals with detailed botanical and ecological aspects and also documents the diversity of forest tree resources in the Eastern Ghats of the northern part of Andhra Pradesh, India.

## MATERIAL AND METHODS

### Study area

The Eastern Ghats of northern Andhra Pradesh lies between  $16^{\circ}15' - 19^{\circ}12'N$  &  $80^{\circ}50' - 84^{\circ}47'E$  and runs through five districts, Srikakulam, Vizianagaram, Visakhapatnam, East Godavari and West Godavari (Fig. 1). The highest elevation in the study area measures

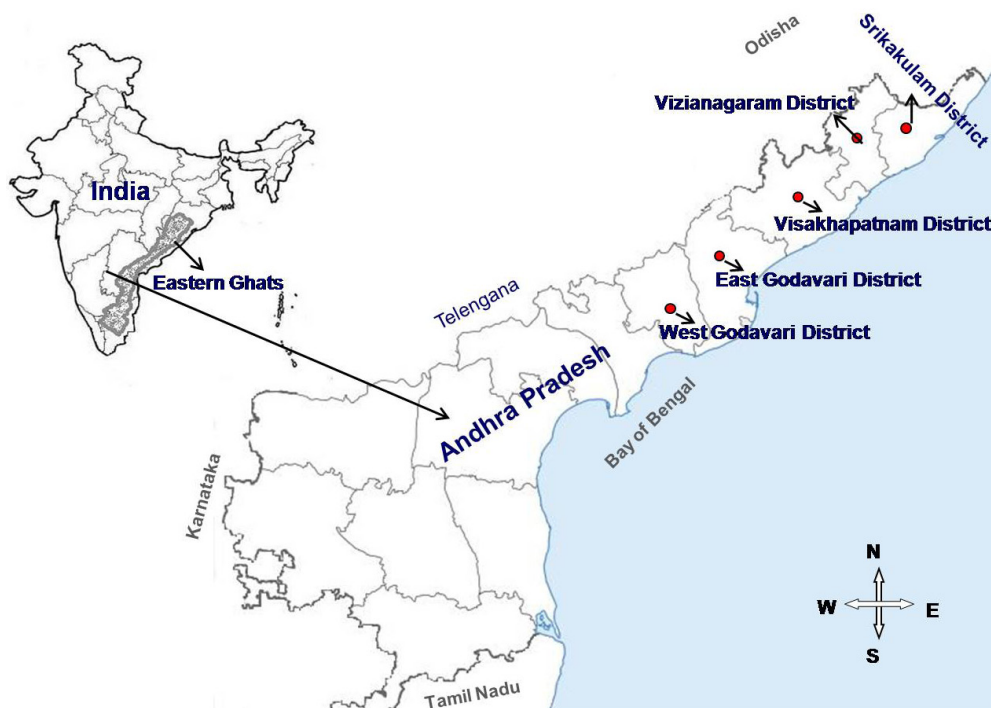


Figure 1. Location map of the study area.

about 1615m altitude. The hill range consists chiefly of charnokites and kondalites and varied metamorphic rocks; and the main soil types are loamy, black, lateritic and alluvial. Lateritic soils are the common type along the deciduous forests of the area (Subrahmanyam 1982). The temperature ranges from 28–46 °C during summer and 13–27 °C during winter. Maximum rain fall occurs between July and September with 1300mm per annum during the south-west monsoon period and the relative humidity is quite high throughout the year: 70–88 % (Naidu et al. 2014). There are five major forest types in the Eastern Ghats of northern Andhra Pradesh which are tropical semi-evergreen, tropical moist-deciduous, tropical dry-deciduous, tropical thorny-scrub vegetation and tropical dry-evergreen forest types (Champion & Seth 1968).

### Data collection

The present study was conducted from 2006–2010. The entire stretch of the Eastern Ghats of northern Andhra Pradesh (650km) was divided on the map into 6.25×6.25 km grids. A total of 210 grids were obtained in the five districts of northern Andhra Pradesh. In each grid, all the living trees of ≥15cm girth at breast height (gbh) were enumerated from a 5×1000 m belt transect of 0.5ha area. Depending on the shape of the forest stand, these transects were divided into 5×200 m sub-transects and data were collected. Voucher specimens were collected, and identified with the help of regional floras (Gamble & Fischer 1915–1935; Rao & Kumari 2002–2008). APG III (APG III 2009) classification was followed to classify the angiosperm species. The voucher specimens are deposited in the Botany Department Herbarium (BDH), Andhra University, Visakhapatnam.

### RESULTS AND DISCUSSION

A total of 270 tree species representing 177 genera belonging to 55 families were recorded from the study area (Table 1; Images 1–5). As per the field observations 141 species were common, 78 species were occasional and 51 species were rare. Of the 55 families, 21 were represented by a single species and 21 other families with more than five species. Of the 177 genera, 128 were represented in the study area by a single species each. Fabaceae was the dominant family with 33 species followed by Rubiaceae with 15 species, Malvaceae, Moraceae and Phyllanthaceae with 13 species each, Rutaceae with 12 species and Lamiaceae with 11 species. According to Pragasan & Parthasarathy (2009),

Euphorbiaceae, Moraceae, Rubiaceae and Rutaceae are dominant families in the southern Eastern Ghats, while Sandhyarani et al. (2007) reported that Euphorbiaceae, Rubiaceae, Moraceae and Lauraceae as the dominant families in the Eastern Ghats. The largest genera include *Ficus* with 12 species, followed by *Diospyros* (8 species), *Albizia* and *Grewia* (6 species each), *Acacia* and *Bauhinia* (5 species each). Sandhyarani et al. (2007) reported 25 species of *Ficus*, 12 species each of *Acacia*, *Diospyros* and *Grewia* as dominants in the Eastern Ghats of southern peninsular India. Pragasan & Parthasarathy (2009) documented 12 species of *Ficus*, eight species of *Diospyros*, six species each of *Acacia* and *Terminalia* in the southern Eastern Ghats of Tamil Nadu. Vegetation-wise analysis reveals that 45% of the taxa inhabit dry deciduous forests, 36% in moist deciduous forests, 28% in semi-evergreen forests, and 10% in thorny-scrub forests and 4% of trees occur in tropical dry evergreen forests. These findings are in conformance with the earlier observations of Reddy et al. (2009). Nativity element wise, the most dominant is the Indian element representing 45%, followed by Indo-Malaysian (23%), tropical Asia-Australia (7.4%), tropical Asia (6%), Indo-Myanmar (5.2%), tropical Africa-India (3.3%), tropical Africa-Asia (3%), tropical Africa Asia-Australia (2%) and other elements contributed 4% in the present study. Meher-Homji (1977) reported that the tropical dry deciduous forests of peninsular India represents 50% of Indian elements followed by Indo-Malayan elements 18.5% and tropical Africa/Malagassy-tropical Asian/Indian groups of elements constituting 4.2–7 %. In the present study, the most abundant tree species were *Xylocarpus xylocarpa* (Fabaceae), *Anogeissus latifolia* (Combretaceae), *Cleistanthus collinus* (Phyllanthaceae), *Dalbergia lanceolaria* ssp. *paniculata* (Fabaceae) in tropical dry deciduous forests, *Dillenia pentagyna* (Dilleniaceae), *Ficus semicordata* (Moraceae), *Mangifera indica* (Anacardiaceae) and *Pterocarpus marsupium* (Fabaceae) in moist deciduous forests, *Syzygium cumini* (Myrtaceae), *Michelia champaca* (Magnoliaceae), *Terminalia chebula* (Combretaceae) in semi-evergreen forests, *Alangium salvifolium* (Cornaceae), *Wrightia tinctoria* (Apocynaceae), *Acacia leucophloea* (Mimosaceae) and *Diospyros vera* (Ebenaceae) in thorny scrub forests and *Bridelia montana* (Euphorbiaceae), *Catunaregum tomentosa* (Rubiaceae) and *Holarrhena pubescens* (Apocynaceae) in dry evergreen forests.

When compared with the data of the earlier reports, the enumerated species richness of 270 tree species was greater than the few inventories of tree species in other tropical forests viz., 103 species from Uppangala, central

Table 1. List of tree species recorded in the Eastern Ghats of northern Andhra Pradesh

Family/Botanical name	Vernacular name (in Telugu)	Nativity	Occurrence	Vegetation type	Voucher No
<b>Anacardiaceae</b>					
<i>Buchanania axillaris</i> (Desr.) Ramamoorthy	Sarapappu	Indian	O	DDF	21413
<i>Buchanania cochinchinensis</i> (Lour.) M.R.Almeida	Jaru mamidi	Indian	O	DDF	21426
<i>Lannea coromandelica</i> (Houtt.) Merr.	Gumpena	Indian	C	DDF	21321
<i>Mangifera indica</i> L.	Mamidi	Indo-Malaysian	C	MDF;CUL	21460
<i>Nothopegia heyneana</i> (Hook.f.) Gamble		Indian	R	MDF;SEF	21521
<i>Semecarpus anacardium</i> L.f.	Nalla jeedi	Tropical Asia-Australia	C	DDF	21448
<i>Spondias pinnata</i> (L.f.) Kurz.	Konda mamidi	Indo-Malaysian	O	MDF;CUL	21556
<i>Terminthia paniculata</i> (Wall. ex G.Don) C.Y.Wu & T.L.Ming		Indo-Burma	R	MDF	21585
<b>Annonaceae</b>					
<i>Alphonsea madraspatana</i> Bedd.		Indian	R	MDF	21587
<i>Alphonsea sclerocarpa</i> Thwaites	Putusu mamidi	Tropical Asia	O	MDF	21555
<i>Annona reticulata</i> L.	Ramaphalamu	Tropical Africa-India	C	CUL;NAT;THF	21336
<i>Annona squamosa</i> L.	Sitaphalamu	Tropical Africa-India	C	CUL;NAT;THF	21302
<i>Milusa tomentosa</i> (Roxb.) J.Sinclair	Budda duduga	Indian	C	MDF	21359
<i>Milusa velutina</i> (Dunal) Hook.f. & Thoms.	Nalla duduga	Indian	O	MDF	21381
<i>Polyalthia cerasoides</i> (Roxb.) Bedd. & Hook.f. ex Bedd.	Chilaka dudduga	Indian	C	DDF	21419
<i>Polyalthia suberosa</i> (Roxb.) Thwaites		Indo-Malaysian	O	DDF	21420
<i>Uvaria hamiltonii</i> Hook.f. & Thomson		Indian	R	MDF	21520
<b>Apocynaceae</b>					
<i>Alstonia scholaris</i> (L.) R.Br.	Edakulapala	Tropical Africa Asia-Australia	R	DDFAVE	21444
<i>Alstonia venenata</i> R.Br.		Indian	O	MDF;SEF	21433
<i>Holarrhena pubescens</i> Wall.	Tedlapala	Indo-Malaysian	C	DDF	21522
<i>Wrightia arborea</i> (Dennst.) Mabb.	Tellapala	Indo-Malaysian	O	DDF	21330
<i>Wrightia tinctoria</i> R.Br.	Ankudu	Indo-Malaysian	C	DEF;DDF	21376
<b>Areaceae</b>					
<i>Caryota urens</i> L.	Jilugu	Indo-Malaysian	C	MDF;CUL	21352
<i>Phoenix sylvestris</i> (L.) Roxb.	Eetha	Indian	C	THF	21378
<b>Bignoniaceae</b>					
<i>Dolichandrone atrovirens</i> (Roth) K.Schum.	Neeruddi	Indian	C	DDF	21519
<i>Dolichandrone falcata</i> (Wall. ex DC.) Seem.	Chittoddi	Indian	C	DDF	21470
<i>Oroxylum indicum</i> (L.) Kurz	Pampini	Indian	O	DDF	21350
<i>Radermachera xylocarpa</i> (Roxb.) Roxb. ex K.Schum.	Naguru	Indian	O	DDF;MDF	21471
<i>Stereospermum chelonoides</i> (L.f.) DC.	Kokkesa	Indian	C	DDF;SEF	21443
<i>Stereospermum tetragonum</i> DC.	Ishakarasi	Indian	O	DEC;SEF	21345
<b>Bixaceae</b>					
<i>Cochlospermum religiosum</i> (L.) Alston	Konda gogu	Indian	C	DDF	21452
<b>Boraginaceae</b>					
<i>Cordia dichotoma</i> G.Forst.	Nakiri	Indian	C	DDF;SCR;CUL	21347
<i>Cordia domestica</i> Roth		Tropical Africa-Asia	R	THF	21557
<i>Ehretia acuminata</i> R.Br.	Tella pisina	Tropical Asia-Australia	R	MDF	21589
<i>Ehretia laevis</i> Roxb.	Rudraksha	Tropical Asia-Australia	C	DEC	21523
<b>Burseraceae</b>					
<i>Boswellia serrata</i> Roxb. ex Colebr.	Anduga	Indian	O	DDF	21586

Family/Botanical name	Vernacular name (in Telugu)	Nativity	Occurrence	Vegetation type	Voucher No
<i>Commiphora caudata</i> (Wight & Arn.) Engl.	Konda regu	Indian	C	DDF	21554
<i>Garuga pinnata</i> Roxb.	Garugu karra	Indo-Malaysian	C	DDF	21361
<i>Protium serratum</i> (Wall. ex Colebr.) Engl.	Chitreka	Indian	C	DDF	21424
<b>Cannabaceae</b>					
<i>Celtis tetrandra</i> Roxb.	Jabjaabal	Indo-Malaysian	R	MDF;SEF	21518
<i>Celtis timorensis</i> Span.	Chipuru	Tropical Asia-Australia	R	MDF;SEF	21
<i>Trema orientalis</i> (L.) Blume	Morali	Indo-Malaysian	C	DDF;SEF	21333
<b>Capparaceae</b>					
<i>Capparis grandis</i> L.f.	Dudippi	Indo-Burma	O	DDF	21524
<i>Crateva religiosa</i> G.Forst.	Ulimidi	Tropical Africa-India	C	DEC;SEF	21340
<b>Celastraceae</b>					
<i>Cassine glauca</i> (Rottb.) Kuntze	Nirija	Indian	C	DDF	21322
<i>Euonymus glaber</i> Roxb.		Indo-Malaysian	O	SEF	21558
<i>Gymnosporia emarginata</i> (Willd.) Thwaites		Tropical	C	SCR;DEF	21590
<i>Maytenus hookeri</i> Loes.		Indian	O	MDF;SEF	21585
<i>Pleurostylia opposita</i> (Wall.) Alston	Kuntichinta	Tropical asia	O	DDF	21517
<b>Clusiaceae</b>					
<i>Garcinia xanthochymus</i> Hook.f. ex T.Anderson	Iwara mamidi	Indian	R	MDF;SEF	21553
<b>Calophyllaceae</b>					
<i>Mesua ferrea</i> L.	Uppa chettu	Indo-Malaysian	R	SEF	21360
<b>Combretaceae</b>					
<i>Anogeissus acuminata</i> (Roxb. ex DC.) Guill.	Pasichettu	Indian	C	RB;DDF	21429
<i>Anogeissus latifolia</i> (Roxb. ex DC.) Wall	Sirimanu	Indian	C	DDF	21343
<i>Terminalia alata</i> Roth	Nalla Maddi	Indian	C	DDF;SEF	21388
<i>Terminalia arjuna</i> (Roxb. ex DC.) Wight & Arn.	Tella Maddi	Indian	C	RB;DDF	21362
<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Thadi	Indo-Malaysian	C	DDF;MDF	21318
<i>Terminalia chebula</i> Retz.	Karaka	Indo-Malaysian	O	MDF;SEF	21334
<b>Cornaceae</b>					
<i>Alangium salvifolium</i> (L.f.) Wangerin	Udugu	Tropical Africa-Asia	C	THF	21464
<b>Cycadaceae</b>					
<i>Cycas circinalis</i> L.		Tropical Asia	C	DDF	21516
<i>Cycas sphaerica</i> Roxb.	Kodhada	Indian	R	MDF	21525
<b>Dilleniaceae</b>					
<i>Dillenia aurea</i> Sm.	Uvva	Indo-Burma	R	MDF;SEF	21559
<i>Dillenia indica</i> L.	Revadi chettu	Indo-Malaysian	O	MDF;SEF	21311
<i>Dillenia pentagyna</i> Roxb.	Kalinga	Indian	C	MDF;SEF	21334
<b>Dipterocarpaceae</b>					
<i>Shorea robusta</i> Gaertn.	Guggilam	Indian	R	MDF	21552
<b>Ebenaceae</b>					
<i>Diospyros chloroxylon</i> Roxb.	Thorika	Indian	C	DDF	21432
<i>Diospyros ebenum</i> J.Koenig ex Retz.	Nallauti	Indian	R	DEF	21584
<i>Diospyros malabarica</i> (Desr.) Kostel.	Neeti thumki	Tropical Africa-Asia	O	RB;MDF	21445
<i>Diospyros melanoxylon</i> Roxb.	Thumki	Indian	C	DEC	21467
<i>Diospyros montana</i> Roxb.	Errra ghata	Tropical Asia-Australia	C	MDF;SEF	21331
<i>Diospyros ovalifolia</i> Wight	Kukka tumki	Indian	O	DEC	21515

Family/Botanical name	Vernacular name (in Telugu)	Nativity	Occurrence	Vegetation type	Voucher No
<i>Diospyros sylvatica</i> Roxb.	Gatha	Indo-Malaysian	O	DEC	21406
<i>Diospyros vera</i> (Lour.) A.Chev.	Pisiniki	Tropical Africa Asia-Australia	O	DEF	21348
<b>Elaeocarpaceae</b>					
<i>Elaeocarpus tectorius</i> (Lour.) Poir.		Indian	R	MDF;SEF	21416
<i>Sloanea sterculiacea</i> (Benth.) Rehder & E.H.Wilson		Indo-Burma	R	MDF;SEF	21455
<b>Erythroxylaceae</b>					
<i>Erythroxylum monogynum</i> Roxb.	Devadaru	Indian	C	DEF	21450
<b>Euphorbiaceae</b>					
<i>Euphorbia antiquorum</i> L.	Peddajemudu	Indian	C	RA	21396
<i>Euphorbia nivulia</i> Buch.-Ham.	Bonthajemudu	Indian	C	RA	21526
<i>Givotia moluccana</i> (L.) Sreem.	Tella poliki	Indian	O	DDF	21551
<i>Lasiodocca comberi</i> Haines		Indo-Malaysian	R	MDF	21560
<i>Macaranga peltata</i> (Roxb.) Muell.-Arg.	Boddi	Tropical Asia	C	MSD;SEF	21309
<i>Mallotus nudiflorus</i> (L.) Kulju & Welzen	Botku	Indo-Malaysian	O	MDF	
<i>Mallotus philippensis</i> (Lam.) Muell.-Arg.	Sindhuramu	Tropical Asia-Australia	C	DEC	21310
<i>Suregada lanceolata</i> (Willd.) Kuntze	Suragada	Indian	O	DDF	21591
<i>Triadica cochinchinensis</i> Lour.		Indo-Malaysian	O	SEF	21597
<b>Fabaceae</b>					
<i>Acacia catechu</i> (L.f.) Willd.	Sandra	Indian	C	DDF	21462
<i>Acacia farnesiana</i> (L.) Willd.		Tropical Asia-America	O	SCR	21583
<i>Acacia ferruginea</i> DC.	Anasandra	India	O	DDF	21514
<i>Acacia horrida</i> (L.f.) Willd.	Kasturi	Tropical Africa-Asia	C	DDF	21561
<i>Acacia leucophloea</i> (Roxb.) Willd.	Tella tumma	Indo-Malaysian	C	DDF	21397
<i>Albizia amara</i> (Roxb.) B.Boivin	Chikreni	Tropical Africa-India	C	DDF	21327
<i>Albizia chinensis</i> (Osbeck) Merr.	Bandi chinduga	Indo-Malaysian	O	DDF	21342
<i>Albizia lebbek</i> (L.) Benth.	Diresana	Tropical Africa Asia-Australia	C	CUL;NAT	21527
<i>Albizia odoratissima</i> (L.f.) Benth.	Ganara	Indo-Malaysian	C	DDF	21367
<i>Albizia procera</i> (Roxb.) Benth.	Pasaraganni	Indo-Malaysian	O	DDF	21387
<i>Albizia thompsonii</i> Brandis	Kondala	Indian	O	DDF	21550
<i>Bauhinia malabarica</i> Roxb.	Pulisintha	Indian	R	DDF	21476
<i>Bauhinia purpurea</i> L.	Kanchanam	Indo-Malaysian	C	DDF;CUL	21320
<i>Bauhinia racemosa</i> Lam.	Arichettu	Indo-Malaysian	C	DEF;DDF	21399
<i>Bauhinia semla</i> Wunderlin	Goddari	Indian	O	MDF;SEF	21461
<i>Bauhinia variegata</i> L.	Devakanchanam	Indo-Malaysian	C	DDF;CUL	21428
<i>Butea monosperma</i> (Lam.) Taub.	Moduga chettu	Indian	C	SCR;DDF	21325
<i>Cassia fistula</i> L.	Rela	Indo-Malaysian	C	DDF	21323
<i>Dalbergia lanceolaria</i> subsp. <i>lanceolaria</i> L.f.	Pasaraganni	Indian	C	DDF	21513
<i>Dalbergia lanceolaria</i> subsp. <i>paniculata</i> (Roxb.) Thoth.	Patsari	Indian	C	DDF	21427
<i>Dalbergia latifolia</i> Roxb.	Iridi	Indian	O	DDF	21368
<i>Desmodium oojeinense</i> ((Roxb.) H.Ohashi	Vandanam	Indian	R	MDF;SEF	21412
<i>Dichrostachys cinerea</i> (L.) Wight & Arn.	Velthuru chettu	Tropical Asia-Australia	C	SCR	21410
<i>Erythrina stricta</i> Roxb.	Mullumoduga	Indo-Malaysian	C	DDF	21562
<i>Erythrina suberosa</i> Roxb.	Barijama	Indian	C	DDF	21326
<i>Erythrina variegata</i> L.	Baditha	Tropical Asia-Australia	C	SCR;CUL	21364

Family/Botanical name	Vernacular name (in Telugu)	Nativity	Occurrence	Vegetation type	Voucher No
<i>Hardwickia binata</i> Roxb.	Nara yepi	Indian	O	MDF	21549
<i>Mundulea sericea</i> (Willd.) A.Cheval	Tella moduga	Tropical Africa-India	C	DDF	21528
<i>Pongamia pinnata</i> (L.) Pierre	Kanugu	Sydhelles-Tropical Asia-Australia	C	RB;AVE	21304
<i>Pterocarpus marsupium</i> Roxb.	Yegisa	Indian	O	DDF;MDF	21369
<i>Saraca asoca</i> (Roxb.) Willd.	Asoka	Indian	R	MDF;RB	21363
<i>Tamarindus indica</i> L.	Chinta	Tropical Africa	C	CUL;NAT;THF	21411
<i>Xylia xylocarpa</i> (Roxb.) Taub.	Tangini	Indi-Malaysian	C	DDF;MDF	21512
<b>Hernandiaceae</b>					
<i>Gyrocarpus americanus</i> Jacq.	Poliki	Tropical Africa Asia-Australia	C	DDF;RS	21308
<b>Lamiaceae</b>					
<i>Callicarpa arborea</i> Roxb.	Gandagummadi	Indo-Malaysian	C	MDF;SEF	21404
<i>Callicarpa tomentosa</i> (L.) Murr.		Indian	C	DDF	21389
<i>Gmelina arborea</i> Roxb.	Gummidi	Indo-Malaysian	C	DDF;MDF	21329
<i>Premna lucidula</i> Miq.	Nelli	Indian	O	MDF	21307
<i>Premna mollissima</i> Roth	Pedda nelli	Indo-Burma	O	DEC	21434
<i>Premna tomentosa</i> Willd.	Kokkiti	Indian	C	DDF	21371
<i>Tectona grandis</i> L.f.	Teku	Indo-Malaysian	C	DEC	21548
<i>Vitex altissima</i> L.f.	Nemali adugu	Indian	O	MDF;RB	21395
<i>Vitex leucoxydon</i> L.f.	Konda vavili	Indian	O	MDF;RB	21403
<i>Vitex pinnata</i> L.	Nemaliadugu	Tropical Asia	C	MDF;SEF	21435
<i>Vitex quinata</i> (Lour.) F.N.Williams		Indo-Malaysian	O	SEF	21529
<b>Lauraceae</b>					
<i>Beilschmiedia sikkimensis</i> King ex Hook.f.		Indian	O	MDF;SEF	21511
<i>Litsea deccanensis</i> Gamble	Naramamidi	Indian	R	DDF	21567
<i>Litsea glutinosa</i> (Lour.) C.B.Rob.	Kanuja	Tropical Asia-Australia	O	DDF;MDF	21472
<i>Litsea monopetala</i> (Roxb.) Pers.	Bhunjada	Indo-Malaysian	O	MDF;SEF	21592
<i>Neocinnamomum caudatum</i> (Nees) Merr.		Tropical Asia	O	MDF;SEF	21598
<i>Neolitsea umbrosa</i> (Nees) Gamble	Bodeda	Indian	O	MDF;SEF	21596
<i>Neolitsea zeylanica</i> (Nees & T.Nees) Merr.		Indo-Malaysian	O	MDF;SEF	21582
<i>Persea macrantha</i> (Nees) Kosterm.	Nara	Indian	R	MDF;SEF	21568
<i>Phoebe wightii</i> Meisn.		Indo-Burma	R	MDF;SEF	21547
<b>Lecythidaceae</b>					
<i>Barringtonia acutangula</i> (L.) Gaertn.	Kanapa	Tropical Asia	C	RB	21409
<i>Careya arborea</i> Roxb.	Kumbhi	Indian	C	DEC	21430
<b>Loganiaceae</b>					
<i>Strychnos nux-vomica</i> L.	Mushini	Indian	C	DEC	21405
<i>Strychnos potatorum</i> L.f.	Induga	Indian	C	DDF	21469
<b>Lythraceae</b>					
<i>Lagerstroemia parviflora</i> Roxb.	Chennangi	Indian	C	DDF	21510
<b>Magnoliaceae</b>					
<i>Michelia champaca</i> (L.) Baill. ex Pierre	Sampangi	Indo-Malaysian	O	SEF	21335
<b>Malvaceae</b>					
<i>Bombax ceiba</i> L.	Buruga	Indo-Malaysian	C	DDF;CUL	21412
<i>Ceiba pentandra</i> (L.) Gaertn.	Tell buruga	Tropical Africa-Asia-America	C	CUL;NAT	21338

Family/Botanical name	Vernacular name (in Telugu)	Nativity	Occurrence	Vegetation type	Voucher No
<i>Eriolaena hookeriana</i> Wight & Arn.	Nara botaka	Indian	R	DDF	21417
<i>Firmiana colorata</i> (Roxb.) R.Br.	Kharka	Indian	O	DDF;MDF	21453
<i>Grewia abutilifolia</i> Vent. ex Juss.	Guvva tada	Tropical Asia	O	MDF	21530
<i>Grewia damine</i> Gaertn.	Chittijana	Tropical Africa-Asia	O	SCR;DDF	21422
<i>Grewia flavescens</i> Juss.	Nelli	Tropical Africa-India	C	SCR;DDF	21569
<i>Grewia rothii</i> DC.	Pedda cipuru	Tropical Africa-India	C	SCR;DDF	21314
<i>Grewia serrulata</i> DC.	Potriki	Indian	O	MDF;SEF	21581
<i>Grewia tiliifolia</i> Vahl	Tada chettu	Tropical Africa-India	C	MDF;DDF	21384
<i>Guazuma ulmifolia</i> Lam.	Bhadraksha	Tropical Africa-America	O	DDF;CUL	21546
<i>Helicteres isora</i> L.	Shamala	Tropical Asia-Australia	C	DDF	21509
<i>Kavalama urens</i> (Roxb.) Raf.	Konda tamara	Indian	R	DDF	21451
<i>Kydia calycina</i> Roxb.	Konda patti	Tropical Africa-India	C	SCR;DDF	21383
<i>Pterospermum xylocarpum</i> (Gaertn.) Santapau & Wagh	Lolugu chettu	Indian	C	DDF	21313
<i>Sterculia villosa</i> Roxb.	Kummari poliki	Indian	R	DDF	21454
<b>Melastomataceae</b>					
<i>Memecylon edule</i> Roxb.	Alli	Indian	C	DEF	21447
<b>Meliaceae</b>					
<i>Aglaia elaeagnoidea</i> (A.Juss.) Benth.	Yerra adugu	Indo-Malaysian	R	MDF	21415
<i>Azadirachta indica</i> A.Juss.	Vepa	Indian	C	THF;CUL	21386
<i>Chukrasia tabularis</i> A.Juss.	Konda vepa	Indian	R	MDF;SEF	21317
<i>Cipadessa baccifera</i> (Roth.) Miq.	Randabalapa	Indo-Malaysian	C	SCR;DDF	21324
<i>Melia dubia</i> Cav.	Munniti-karaka	Indo-Malaysian	O	MDF;SEF	21531
<i>Soymida febrifuga</i> (Roxb.) A.Juss.	Somothi	Indian	C	DDF	21366
<i>Toona ciliata</i> M.Roem.	Galimanu	Tropical Asia-Australia	R	MDF	21370
<i>Trichilia connaroides</i> (Wight & Arn.) Benth.	Garugu	Indo-Malaysian	C	MDF;DDF	21414
<i>Walsura trifoliata</i> (A. Juss.) Harms	Walsuri	Indian	O	MDF;SEF	21425
<b>Moraceae</b>					
<i>Artocarpus heterophyllus</i> Lam.	Panasa	Tropical	C	SEF;CUL	21394
<i>Artocarpus lakoocha</i> Roxb.	Nakkarenu	Tropical Asia	R	CUL;SEF	21545
<i>Ficus arnottiana</i> (Miq.) Miq.	Bandaravi	Indian	C	MDF;SEF	21401
<i>Ficus auriculata</i> Lour.	Racha bodda	Indo-Burma	R	MDF;SEF	21475
<i>Ficus benghalensis</i> L.	Marri chettu	Tropical Africa-India	C	CUL;Forests	21508
<i>Ficus benjamina</i> L.	Putra juvvi	Indo-Malaysian	O	MDF	21358
<i>Ficus exasperata</i> Vahl	Karaka boddu	Tropical Africa-Asia	O	DDF	21379
<i>Ficus hispida</i> L.f.	Bodda chettu	Tropical Asia-Australia	C	THF;hedges	21348
<i>Ficus microcarpa</i> L.f.	Yerra juvvi	Indian	C	THF;hedges	21332
<i>Ficus mollis</i> Vahl	Kala juvi	Indian	C	DDF	21354
<i>Ficus nervosa</i> B.Heyne ex Roth	Vonjar	Tropical Asia	O	MDF	21440
<i>Ficus racemosa</i> L.	Medi	Indo-Burma	C	SEF;RB	21377
<i>Ficus religiosa</i> L.	Ravi	Indian	C	NAT;CUL	21439
<i>Ficus semicordata</i> Buch.-Ham. ex Sm.	Bommala marri	Indo-Malaysian	C	MDF;SEF	21400
<i>Streblus asper</i> Lour.	Barnika	Indo-Malaysian	C	Hedges;THF	21393
<i>Streblus taxoides</i> (Roth) Kurz		Indo-Burma	O	MDF;SEF	21543
<b>Moringaceae</b>					
<i>Moringa concanensis</i> Nimmo ex Dalzell & A.Gibson	Adavi munaga	Indian	O	DDF	21532



Family/Botanical name	Vernacular name (in Telugu)	Nativity	Occurrence	Vegetation type	Voucher No
<b>Myrtaceae</b>					
<i>Myrcia bracteata</i> (Rich.) DC.	Arivita	Indian	C	THF	21507
<i>Syzygium cumini</i> (L.) Skeels	Neredu	Tropical Asia-Australia	C	RB;CUL	21372
<b>Ochnaceae</b>					
<i>Ochna obtusata</i> var. <i>gamblei</i> DC.	Chittimovi	Tropical Asia	C	DDF	21301
<i>Ochna obtusata</i> var. <i>obtusata</i> DC.	Tammi	Tropical Asia	C	DDF	21570
<b>Oleaceae</b>					
<i>Chionanthus mala-elengi</i> (Dennst.) P.S.Green	Porumbolu	Indian	R	SEF	21593
<i>Chionanthus ramiflorus</i> Roxb.	Kurma gochh	Tropical Africa Asia-Australia	R	MDF;SEF	21580
<i>Nyctanthes arbor-tristis</i> L.	Parijathamu	Indian	C	DEC	21390
<i>Olea dioica</i> Roxb.		Indian	R	SEF	21542
<i>Schrebera swietenoides</i> Roxb.	Mokkem	Indian	O	DDF;MDF	21468
<b>Phyllanthaceae</b>					
<i>Antidesma acidum</i> Retz.	Gumudu	Indian	C	MDF	21357
<i>Antidesma bunius</i> (L.) Spreng.	Anepu	Tropical	R	MDF;SEF	21507
<i>Antidesma ghaesembilla</i> Gaertn.	Pulleru	Tropical Asia-Australia	C	MDF	21474
<i>Antidesma montanum</i> var. <i>montanum</i> (Tul.) Muell.-Arg.		Indo-Malaysian	R	MDF;SEF	21533
<i>Bischofia javanica</i> Blume	Nalupumsthi	Indo-Malaysian	O	MDF;SEF	21441
<i>Bridelia glauca</i> Blume		Tropical Asia	O	SEF	21571
<i>Bridelia montana</i> (Roxb.) Willd.	Panchavoni	Indian	C	DEF;DDF	21442
<i>Bridelia retusa</i> (L.) A.Juss.	Anemu	Indian	C	DEC	21351
<i>Cleistanthus collinus</i> (Roxb.) Benth. ex Hook.f.	Vadisa	Indian	C	DDF	21356
<i>Cleistanthus monoicus</i> (Lour.) Muell.-Arg.	Tella balli	Tropical Asia-Australia	C	MDF	21473
<i>Cleistanthus patulus</i> (Roxb.) Muell.-Arg.	Jiguru	Indian	O	MDF;SEF	21380
<i>Glochidion ellipticum</i> Wight		Tropical Asia	C	MDF;SEF	21402
<i>Glochidion heyneanum</i> (Wight & Arn.) Wight		Indian	O	MDF;SEF	21436
<i>Glochidion zeylanicum</i> var. <i>tomentosum</i> (Dalzell) Trimen	Pageri	Indian	O	MDF;SEF	21506
<i>Glochidion zeylanicum</i> var. <i>zeylanicum</i> (Gaertn.) A.Juss.		Indo-Burma	O	MDF;SEF	21353
<i>Phyllanthus emblica</i> L.	Usiri	Indo-Malaysian	C	DDF;SEF;CUL	21355
<b>Pittosporaceae</b>					
<i>Pittosporum napaulense</i> (DC.) Rehder & E.H.Wilson	Rakamuki	Indo-Burma	R	MDF	21341
<b>Primulaceae</b>					
<i>Ardisia solanacea</i> (Poir.) Roxb.	Adavi Mayuri	Indo-Malaysian	C	MDF;SEF	21541
<b>Putranjivaceae</b>					
<i>Putranjiva roxburghii</i> Wall.	Putrajivika	Tropical Asia	O	DEC;CUL	21572
<b>Rhamnaceae</b>					
<i>Ziziphus abyssinica</i> Hochst. ex A.Rich	Gotti chettu	Indian	O	DDF	21458
<i>Ziziphus mauritiana</i> Lam.	Regu	Tropical Asia-Australia	C	SCR;DDF	21303
<b>Rosaceae</b>					
<i>Prunus ceylanica</i> (Wight) Miq.		Indo-Malaysian	R	MDF;SEF	21534
<b>Rubiaceae</b>					
<i>Catunaregum tomentosa</i> (DC.) Tirv.	Kotuvagoch	Indian	C	DEF	21505
<i>Gardenia gummifera</i> L.f.	Bikki	Indian	C	DEC	21306
<i>Gardenia latifolia</i> Aiton	Pedda Bikki	Indian	C	DEC	21305
<i>Haldina cordifolia</i> (Roxb.) Ridsdale	Kamba	Indian	C	DDF	21374

Family/Botanical name	Vernacular name (in Telugu)	Nativity	Occurrence	Vegetation type	Voucher No
<i>Hymenodictyon orixense</i> (Roxb.) Mabb.	Dudippa	Indo-Malaysian	C	DEC	21408
<i>Ixora pavetta</i> Andr.	Kolimi	Tropical Asia	C	DDF	21431
<i>Meyna spinosa</i> Roxb. ex Link	Veliki	Indo-Burma	R	MDF;SEF	21446
<i>Mitragyna parvifolia</i> (Roxb.) Korth.	Batakanagu	Indian	C	DEC	21328
<i>Morinda pubescens</i> J.E.Sm.	Togara	Indo-Malaysian	C	DDF	21391
<i>Neonauclea purpurea</i> (Roxb.) Merr.	Kadamba	Indo-Malaysian	O	MDF;SEF	21540
<i>Pavetta indica</i> L.	Papidi	Tropical Asia-Australia	C	DDF	21579
<i>Psydrax dicoccos</i> Gaertn.	Niralli	Indo-Malaysian	C	DEC	21465
<i>Tamilnadia uliginosa</i> (Retz.) Tirveng. & Sastre	Adavi manga	Indo-Burma	R	DDF	21504
<i>Wendlandia gamblei</i> Cowan		Indian	R	MDF;SEF	21392
<i>Wendlandia heynei</i> (Schult.) Santapau & Merchant	Konkupuchu	Indian	R	MDF;SEF	21573
<b>Rutaceae</b>					
<i>Aegle marmelos</i> (L.) Corr.	Maredu	Indian	O	DDF	21315
<i>Atalantia monophylla</i> DC.	Karunimma	Indian	C	SCR;DDF	21316
<i>Chloroxylon swietenia</i> DC.	Billa karra	Indian	C	DDF	21457
<i>Citrus medica</i> L.	Lungamu	Indian	R	Along streams	21578
<i>Clausena heptaphylla</i> (Roxb.) Wight & Arn.		Indian	O	MDF;SEF	21539
<i>Glycosmis pentaphylla</i> (Retz.) DC.		Indo-Malaysian	C	DDF	21535
<i>Limonia acidissima</i> L.	Velaga	Indian	C	DDF;SCR;CUL	21339
<i>Murraya paniculata</i> (L.) Jack	Nara gongi	Tropical	C	RB	21456
<i>Naringi alata</i> (Wall. ex Wight & Arn.) Ellis	Munukudu	Indian	O	DEF;DDF	21503
<i>Naringi crenulata</i> (Roxb.) Nicols.	Torri velaga	Indo-Malaysian	C	DDF	21449
<i>Zanthoxylum armatum</i> DC.	Konda kasimi	Indian	O	MDF;SEF	21385
<i>Zanthoxylum rhetsa</i> DC.	Rhetsa	Indian	R	MDF;SEF	21594
<b>Sabiaceae</b>					
<i>Meliosma simplicifolia</i> (Roxb.) Walp.		Indo-Malaysian	R	MDF;SEF	21574
<b>Salicaceae</b>					
<i>Casearia graveolens</i> Dalz.	Giduguru	Indian	C	DDF;MDF	21382
<i>Flacourtia indica</i> (Burm.f.) Merr.	Kuragayi	Malagassy-Indo-Malaysian	O	DDF	21312
<i>Flacourtia jangomas</i> (Lour.) Raeusch.	Pulivelaga	Indo-Malaysian	R	DDF	21595
<i>Guidonia tomentosa</i> (Roxb.) Kurz	Chilaka duddi	Tropical Asia	O	DDF	21418
<i>Homalium nepalense</i> Benth.	Manthralamukhi	Indian	C	MDF	21337
<i>Xylosma longifolia</i> Clos		Indian	O	SEF	21577
<b>Sapindaceae</b>					
<i>Allophylus cobbe</i> (L.) Raeusch.	Guna gutti	Tropical Africa-Asia-America	C	DDF	21538
<i>Dodonaea viscosa</i> Jacq.		Warm countries	C	THF	21536
<i>Erioglossum rubiginosum</i> (Roxb.) Blume	Ishirasi	Tropical Asia-Australia	R	SEF	21502
<i>Lepisanthes tetraphylla</i> Radlk.	Korivi	Tropical Africa-Asia	R	MDF;DDF	21459
<i>Sapindus trifoliatus</i> L.	Ritta chettu	Indo-Malaysian	C	DDF;CUL	21365
<i>Schleichera oleosa</i> (Lour.) Merr.	Bushi chettu	Indo-Malaysian	C	DDF	21398
<b>Sapotaceae</b>					
<i>Madhuca indica</i> J.F.Gmel.	Ippa	Indian	C	DEC	21392
<i>Madhuca longifolia</i> (Koen.) Macbr.	Pedda Ippa	Indian	C	DEC	21407
<i>Manilkara hexandra</i> (Roxb.) Dubard	Palachettu	Indo-Malaysian	C	DEF	21346

Family/Botanical name	Vernacular name (in Telugu)	Nativity	Occurrence	Vegetation type	Voucher No
<i>Mimusops elengi</i> L.	Pogada	Tropical Asia-Australia	C	MDF;CUL	21373
<i>Xantolis tomentosa</i> (Roxb.) Raf.	Bejjurenu	Indo-Burma	R	MDF;SEF	21375
<b>Simaroubaceae</b>					
<i>Ailanthus excelsa</i> Roxb.	Peddamanu	Tropical Africa-Asia	C	SCR	21385
<i>Picrasma javanica</i> Blume		Indo-Malaysian	R	MDF;SEF	21575
<b>Ulmaceae</b>					
<i>Holoptelea integrifolia</i> (Roxb.) Planch.	Nemali chettu	Indo-Malaysian	C	DEC;RS	21437
<b>Urticaceae</b>					
<i>Debregeasia longifolia</i> (Burm.f.) Wedd.	Kerangi	Indian	O	MDF;SEF	21576
<i>Dendrocnide sinuata</i> (Blume) Chew		Indo-Malaysian	O	MDF;SEF	21537
<b>Vitaceae</b>					
<i>Leea indica</i> (Burm.f.) Merr.		Tropical Asia-Australia	C	MDF;SEF	21319
<b>Zygophyllaceae</b>					
<i>Balanites roxburghii</i> Planch.		Indian	O	DDF	21501

C - Common, O - Occasional, R - Rare. AVE - Avenue; CUL - Cultivated; DDF - Dry deciduous forest; DEC - Deciduous; DEF - Dry evergreen forest; MDF - Moist deciduous forests; NAT - Naturalized; RA - Rocky areas; RB - River Banks; RS - Road sides; SCR - Scrub; SEF - Semi-evergreen forest; THF - Thorny forests

Western Ghats (Pascal & Pelissier 1996); 148 species from Varagalair, Anamalais (Ayyappan & Parthasarathy 1999); 157 species from Mudumalai Sanctuary (Suresh et al. 1996); 164 species from Biligiri Rangaswamy Sanctuary (Ramesh 2002) and 211 species in Huai Kha Khaeng, Thailand and 226 species in Barro Colorado Island, Panama (Condit et al. 2000). But, lesser than the 272 species from the southern Eastern Ghats of Tamil Nadu (Pragasam & Parthasarathy 2009); 673 species in Pasoh, Malaysia and 996 species encountered in Lambir, peninsular Malaysia (Condit et al. 2000).

## CONCLUSION

Overall, the findings on the tree species diversity of the Eastern Ghats forests of northern Andhra Pradesh show a high species richness. Among the families, Fabaceae is the dominant family followed by Rubiaceae, Malvaceae, Moraceae and Phyllanthaceae. The most dominant nativity element is of Indian origin which comprises 45% followed by the Indo-Malaya region. From the total species of 560 trees of the entire Eastern Ghats, nearly half of the tree species diversity exists in the Eastern Ghats of northern Andhra Pradesh forests. In view of its richness and occurrence of rare species (51), intensive floristic studies need to be conducted for proper documentation and species wise ecological status assessment. Such studies will also aid focused conservation management as well as ensure sustainable

utilization of plant resources in the Eastern Ghats forests of Andhra Pradesh.

## REFERENCES

- APG III (2009). An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG III. *Botanical Journal of the Linnean Society* 161: 105–121; <http://dx.doi.org/10.1111/j.1095-8339.2009.00996.x>
- Ayyappan, N. & N. Parthasarathy (1999). Biodiversity inventory of trees in a large-scale permanent plot of tropical evergreen forest at Varagalair, Anamalais, Western Ghats, India. *Biodiversity and Conservation* 8: 1533–1554.
- Champion, H.G. & S.K. Seth (1968). *The Revised Forest Types of India*. Government of India, New Delhi.
- Chittibabu, C.V. & N. Parthasarathy (2000). Attenuated tree species diversity in human-impacted tropical evergreen forest at Varagalair, Anamalais, Western Ghats, India. *Biodiversity and Conservation* 9: 1493–1519.
- Condit, R., P.S. Ashton, P. Baker, S. Bunyavejchewin, S. Guntatilleke, N. Guntatilleke, S.P. Hubbell, R.B. Foster, A. Itoh, J.V. LaFrankie, H.S. Lee, E. Losos, N. Manokaran, R. Sukumar & T. Yamakura (2000). Spatial patterns in the distribution of tropical tree species. *Science* 288: 1414–1417; <http://dx.doi.org/10.1126/science.288.5470.1414>
- Gamble, J.S. & C.E.C. Fischer (1915–1935). *Flora of the Presidency of Madras - Vols. I–III*. Adlard & Sons, London, 1685pp.
- Kumar, M. & V.P. Bhatt (2006). Plant biodiversity and conservation of forests in foot hills of Garhwal Himalaya. *Journal of Ecology and Application* 11(2): 43–59.
- Lawrence, G.H.M. (1951). *Taxonomy of Vascular Plants*. University of Wisconsin - Stevens Point, New York.
- May, R.M. & M.P.H. Stumpf (2000). Species-area relationships in tropical forests. *Science* 290: 2084–2086.
- Meher-Homji, V.M. (1977). Tropical dry deciduous forests of peninsular India. *Feddes Reportorium* 88(1–2): 113–134; <http://dx.doi.org/10.1002/fedr.19770880106>
- Naidu, M.T., O.A. Kumar & M. Venkaiah (2014). Taxonomic diversity



Image 1 (a-r). a - *Aegle marmelos*; b - *Aglaia elaeagnoidea*; c - *Albizia amara*; d - *Albizia chinensis*; e - *Albizia odoratissima*; f - *Alstonia venenata*; g - *Anogeissus latifolia*; h - *Antidesma ghaesembilla*; i - *Barringtonia acutangula*; j - *Bauhinia malabarica*; k - *Bauhinia semla*; l - *Bischofia javanica*; m - *Bridelia retusa*; n - *Buchanania axillaris*; o - *Buchanania cochinchinensis*; p - *Butea monosperma*; q - *Callicarpa arborea*; r - *Careya arborea*. © M. Tarakeswara Naidu



Image 2 (a–r). a - *Caryota urens*; b - *Casearia graveolens*; c - *Cassia fistula*; d - *Cassine glauca*; e - *Cleistanthus patulus*; f - *Dalbergia latifolia*; g - *Dalbergia lanceolaria* subsp. *paniculata*; h - *Dillenia indica*; i - *Diospyros chloroxylon*; j - *Diospyros malabarica*; k - *Diospyros sylvatica*; l - *Elaeocarpus tectorius*; m - *Eriolaena hookerian*; n - *Ficus semicordata*; o - *Ficus mollis*; p - *Firmiana colorata*; q - *Flacourtia jangomas*; r - *Gardenia latifolia*. © M. Tarakeswara Naidu



Image 3 (a–r): a - *Garuga pinnata*; b - *Glochidion ellipticum*; c - *Glochidion heyneanum*; d - *Gyrocarpus americanus*; e - *Haldina cordifolia*; f - *Hymenodictyon orixense*; g - *Kydia calycina*; h - *Lagerstroemia parviflora*; i - *Lannea coromandelica*; j - *Leea indica*; k - *Lepisanthes tetraphylla*; l - *Limonia acidissima*; m - *Litsea glutinosa*; n - *Macaranga peltata*; o - *Madhuca indica*; p - *Mallotus philippensis*; q - *Mangifera indica*; r - *Mesua ferrea*. © M. Tarakeswara Naidu



Image 4 (a–r). a - *Meyna spinosa*; b - *Mitragyna parvifolia*; c - *Ochna obtusata* var. *obtusata*; d - *Oroxylum indicum*; e - *Desmodium oojeinense*; f - *Phyllanthus emblica*; g - *Polyalthia cerasoides*; h - *Polyalthia suberosa*; i - *Premna tomentosa*; j - *Pterocarpus marsupium*; k - *Pterospermum xylocarpum*; l - *Radermachera xylocarpa*; m - *Saraca asoca*; n - *Schleichera oleosa*; o - *Schrebera swietenoides*; p - *Semecarpus anacardium*; q - *Sloanea sterculiacea*; r - *Soymida febrifuga*. © M. Tarakeswara Naidu



Image 5 (a–r). a - *Kavalama urens*; b - *Stereospermum chelonoides*; c - *Stereospermum tetragonum*; d - *Strychnos potatorum*; e - *Syzygium cumini*; f - *Terminalia alata*; g - *Terminalia bellirica*; h - *Terminalia chebula*; i - *Toona ciliata*; j - *Trichilia connaroides*; k - *Vitex leucoxyton*; l - *Vitex pinnata*; m - *Wendlandia gamblei*; n - *Xantolis tomentosa*; o - *Xylia xylocarpa*; p - *Zanthoxylum armatum*; q - *Zanthoxylum rhesta*; r - *Ziziphus mauritiana*. © M. Tarakeswara Naidu



- of lianas in tropical forests northern Eastern Ghats of Andhra Pradesh, India. *Notulae Scientia Biologicae* 6(1): 59–65.
- Pascal, J.P. & R. Pelissier (1996).** Structure and floristic composition of tropical evergreen forests in south India. *Journal of Tropical Ecology* 12: 191–214; <http://dx.doi.org/10.1017/S026646740000941X>
- Pragasam, L.A. & N. Parthasarathy (2009).** Angiosperms, tree species in tropical forests of southern Eastern Ghats, Tamil Nadu, India. *Check List* 5(3): 542–569.
- Pragasam, L.A. & N. Parthasarathy (2010).** Landscape-level tree diversity assessment in tropical forests of southern Eastern Ghats. *Flora* 205: 728–737; <http://dx.doi.org/10.1016/j.flora.2010.04.011>
- Premavani, D., M.T. Naidu & M. Venkaiah (2014).** Tree species diversity and population structure in the tropical forests of north central Eastern Ghats, India. *Notulae Scientia Biologicae* 6(4): 448–453; <http://dx.doi.org/10.1583/nsb649382>
- Raghubanshi, A.S. & A. Tripathi (2009).** Effect of disturbance, habitat fragmentation and line invasive plants on floral diversity in dry tropical forests of Vindhyan highlands: a review. *Tropical Ecology* 50: 57–69.
- Ramesh, B.R. (2002).** Evergreen forests of Biligirirangan hills, south India. Proceedings of the national seminar on Conservation of Eastern Ghats, EPTRI, Hyderabad, 103–108pp.
- Rao, G.V.S. & G.R. Kumari (2002–2008).** *Flora of Visakhapatnam District, Andhra Pradesh - Volume 1–2*. Botanical Survey of India, Kolkata.
- Reddy, C.S., K.N. Reddy, E.N. Murthy & V.S. Raju (2009).** Tree wealth of Eastern Ghats of Andhra Pradesh, India. *Check List* 5(2): 173–194.
- Reddy, C.S. & P.R.C. Prasad (2008).** Tree flora of Saddle Peak National Park, Andaman, India. *Journal of Plant Sciences* 3: 1–17.
- Sagar, R., A.S. Raghubanshi & J.S. Singh (2003).** Tree species composition, dispersion and diversity along a disturbance gradient in a dry tropical forest region of India. *Forest Ecology and Management* 186: 61–71; [http://dx.doi.org/10.1016/S0378-1127\(03\)00235-4](http://dx.doi.org/10.1016/S0378-1127(03)00235-4)
- Sahu, S.C., N.K. Dhal, B. Lal & R.C. Mohanty (2012).** Differences in tree species diversity and soil nutrient status in a tropical sacred forest ecosystem on Niyamgiri hill range, Eastern Ghats, India. *Journal of Mountain Science* 9: 492–500; <http://dx.doi.org/10.1007/s11629-012-2302-0>
- Subrahmanyam, V.P. (1982).** Eastern Ghats Region, vegetation and climatic aspects. Proceedings of the seminar on Resources, Development and Environment on the Eastern Ghats, 26pp.
- Suresh, H.S., H.S. Dattaraj & R. Sukumar (1996).** Tree flora of Madumalai Sanctuary, Tamil Nadu, southern India. *Indian Forester* 122: 507–519.
- Wilson, E.O. (1988).** The current state of biological diversity, pp. 3–88. In: Wilson, E.O. (ed.). *Biodiversity*. The National Academic Press, Washington DC.

