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3. The link of feedback provided by Participants:

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Dr. B. Sadasivaiah
Asst. Professor of Botany

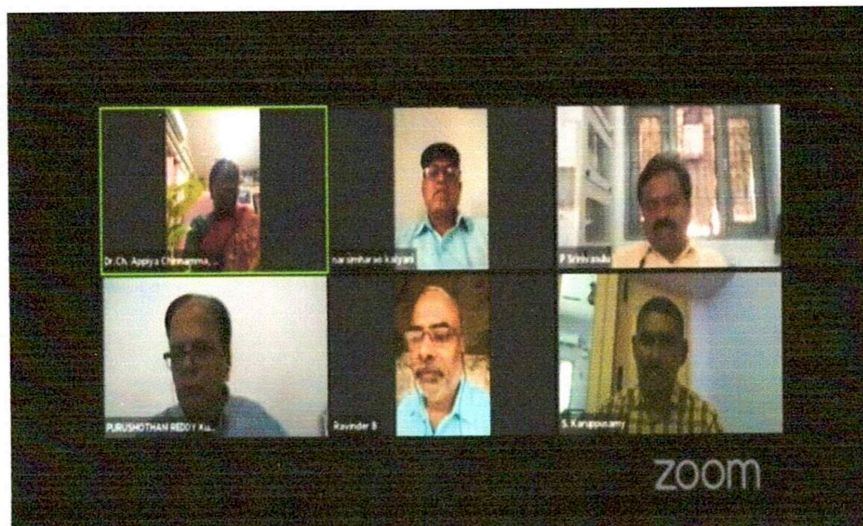
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HOD of Botany

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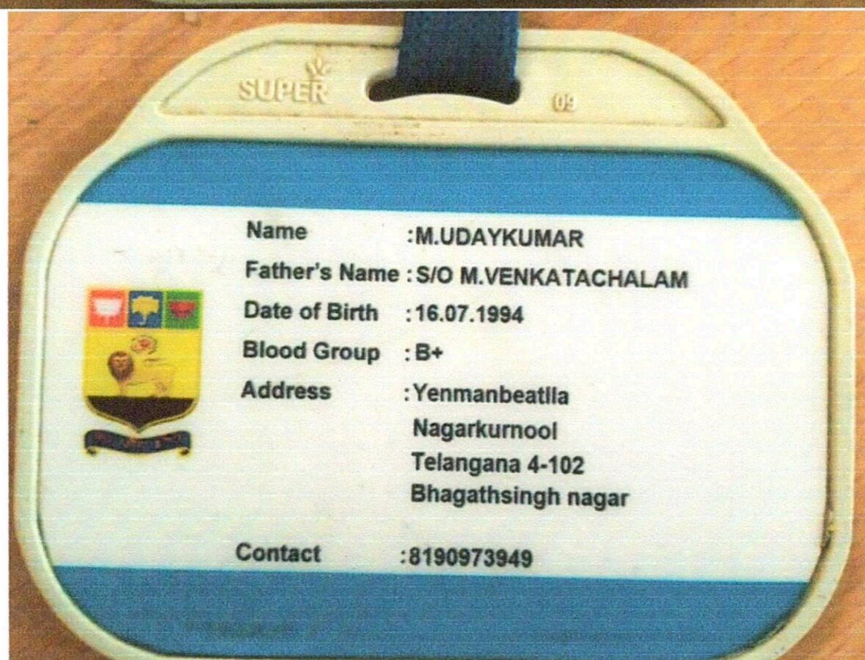
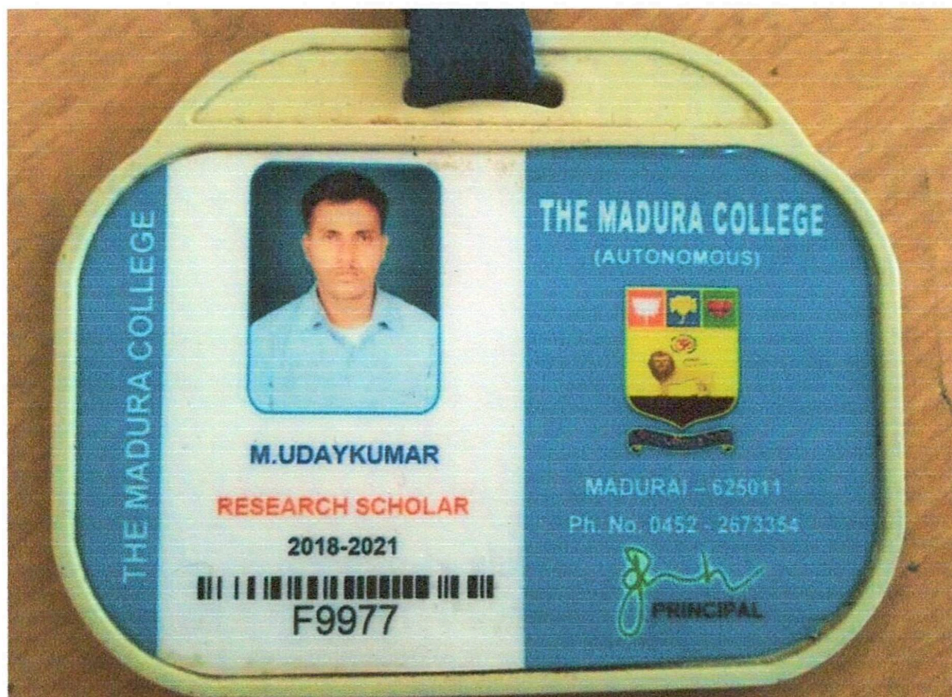


Certificates given to the Participants


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2. Offering Research Guidance

Dr. B. Sadasivaiah, Assistant Professor of Botany extended his services in the collection of flora by Mr. M. Uday Kumar, the Ph.D. Student of Dr.S.Karuppu Swamy, Department of Botany, Madura College, Madhuai, Tamilnadu, ,



[Signature]
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3. Research Publications

As a part of MoU, Dr. B. Sadasivaiah provided research support to the Research Scholar M. Uday Kumar, Department of Botany, The Madura College, Madurai Tamil Nadu and published combined research articles

SPECIES | REPORT

Species

23(71), 2022

Four endemic Euphorbiaceae taxa additions to Telangana state, India

Avula Ramakrishna^{1,5}, Sake Akkulanna², Mummadi Uday Kumar³, Ravi Kiran Arigela⁴, Byalla Sadasivaiah^{6*}, Nirmala Babu Rao¹

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ABSTRACT

An endangered and endemic taxon *Phyllanthus narayanasiamii* Gamble is reported from Nallamalais of Telangana region. Thus it forms a new distributional record for the state of Telangana. Endemic taxa *Euphorbia deccanensis* V.S. Raju, *Euphorbia deccanensis* var. *nallamalavana* (J.L. Ellis) V.S. Raju and *Euphorbia schuyptae* N.P. Balakr. & Subr. are reported here as new records for the Flora of Telangana State.

Keywords: Endangered, Endemic, Extended distribution, Eastern Ghats, Grasslands and Palmi Hills.

1. INTRODUCTION

Euphorbia s.l. the largest genus in the family Euphorbiaceae s.l. and sixth largest genus among the flowering plants, consisting of about 2000 species (Malpure *et al.*, 2021) and occurring throughout the world chiefly seen in tropical, subtropical and warm temperate regions. The genus comprises more than 80 species in India with highest number of endemics (Binojumar & Balakrishnan 2010, Sarojidevi, 2017, Malpure, 2021). Cyathium is the general character of the Tribe Euphorbiae. The cyathium is actinomorphic bearing a ring of broken glands at the rim of the involucrel cup, a solitary sessile or


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Phenological Patterns of Selected Tree Species in Amrabad Tiger Reserve, Telangana, India

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Abstract: The present paper deals with phenology of selected tree species like *Phyllanthus emblica*, *Dalbergia paniculata*, *Hardwickia binata*, *Anogeissus latifolia*, *Albizia thompsonii*, *Cheroloxylon swietenia*, *Diospyros melanoxylon*, *Givofia moluccana*, *Buchanania axillaris*, *Terminalia alata*, *Sterculia urens*, *Strychnos nux-vomica*, *Bombax ceiba*, *Butea monosperma*, *Madhuca indica*, *Eriocarya lushingtonii*, *Albizia odoratissima*, *Terminalia bellica*, *Pterocarpus marsupium*, *Fimbrana colorata*, *Careya arborea* in Amrabad Tiger Reserve, Telangana, India. The phenological observations include leaf flush, leaf mature, leaf fall, leaf less periods, flowering, fruting, fruit fall, among the selected tree species. A total of ten individuals (2.50 cm girth), for each of the selected 21 tree species were observed at fifteen days interval during 2018-2020. It was observed that there were species specific phenophases relationship with deciduous period and initiation of seasonal rainfall and warm periods. In addition, intra species asynchrony in phenological activities was also recorded. Leaf flush activity was initiated in March and reached peak in the month of April and completed before the initiation of South-West monsoon. Leaf maturity started in the month of May and peak was recorded in June and completed in September. Leaf fall activity was initiated in the month of November and reached peak in January before the arrival of intense dry period. Deciduous period was recorded in December to April and the peak period was recorded in February. The reproductive phenophases like Flowering, Fruting and Fruit fall have significantly varied across the different seasons among the observed tree species. Majority of tree species (43%) revealed synchronous flowering with Leaf flush activity. The results indicate that Leafing (48%) and flowering phenophases (70%) occur during the dry period before the onset of first rains and fruting, fruit fall timing was in consequence to utilize the growing season. Thus, species specificity was recorded with respect to Phenophases were found to be in relation with the seasonal rainfall distribution and in turn soil moisture availability in the study area.

Keywords: Phenophases, Amrabad Tiger Reserve, Synchronous flowering

Among the plants, the variations in phenological activities such as leaf flush, leaf fall, and flowering were directly related to deciduous period, seasonal distribution of rainfall, soil moisture and temperature (Moza and Bhatnagar 2005). Tropical dry deciduous forest consists of tree communities which grow in climates with marked pronounced dry and wet conditions in an annual period (Singh and Kushwaha 2006). Nanda et al (2014) observed that these forests constitute high variations in vegetative and reproductive phenological patterns at both large scale and small scales. The phenophases of tree species were mainly found to be based on the seasonal changing events such as availability of soil moisture, stem water status, photoperiod, changes in temperature and irradiance (Singh and Sahoo 2019) and biotic factors like pollinators attraction, competition for seed dispersers and avoidance of herbivore have been proposed to influence different phenological patterns in tropical dry forests (Singh and Kushwaha 2005). Thus phenological events should be assessed by both abiotic factors and plant

functional traits to achieve integrative understanding of tree community (Saha 2007). In seasonal tropical forests, plant phenological patterns were controlled by various interactions between biotic and climatic factors, especially seasonal variation in rainfall, dry periods which influence soil moisture, tree water status are considered as the principal factors influencing the timings of the periodic phenophases of growth and reproduction (Sakai 2001). In dry forests of southern Eastern Ghats the peak leaf flushing activity and flowering events occur during the dry period before the onset of first rains and fruit maturation period is high and fruit fall timing is in consequence to utilize the rains for germination. Thus, seasonal rains (soil moisture availability) and extent of deciduous period (photoperiod) influence the leafing and reproductive phenological events in dry deciduous forest (Mastan et al 2020). Few communities wide phenological studies in dry forests were carried out in dry forests of India, (Singh and Kushwaha, 2005, Nanda et al 2014, Mastan et al 2020). But no phenological studies were carried out in the dry


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RESEARCH ARTICLE

Addition of five grass species to the state of Telangana

A. Ramakrishna^{1*}, S. Shankar¹, M. Uday Kumar¹, B.Kaipana¹, B. Sadasiviah², A. Madhusudhan Reddy³, Nirmala Baburao⁴ and T. Pullaiah⁵

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Abstract Five species of Poaceae namely *Arundinella nervosa*, *Enteropogon monostachyos*, *Eulalia phaeothrix*, *Oryza officinalis* and *Panicum fischeri* collected from Amrabad Tiger Reserve, Telangana and reported here as new additions to the flora of Telangana state. Apart, the detailed description, ecology and distribution information is facilitated here.

Key words: Distribution, Ecology, Endemic, Grass, New records, Poaceae

Introduction

Telangana state is situated in the central stretch of the eastern seaboard of the Indian Peninsula with an area of 114,840 km² and lies between 15.50' - 19.55' N latitudes and 77.14' - 78.50' E longitudes. The area is divided into two main regions, the Eastern Ghats and the plains. The Nallamala Hill ranges of Telangana distributed in Nagarkurnool and Nalgonda districts. These hills possess moist deciduous, dry deciduous and scrub forests. The family Poaceae is represented by 242 species (Pullaiah 2015, Reddy and Reddy 2016, Reddy 2018, Nagaraju *et al.* 2019 a,b, 2020 a,b, 2021 a,b,c; Nagaraju & Annamma 2021; Nagaraju and Bharath 2021, Swamy and Nagaraju 2019, Swamy *et al.* 2021, Swamy and Arumugam 2021) in Telangana

state. While inventorying the grasses of Amrabad Tiger Reserve, Telangana, the authors collected five interesting species of grasses. Detailed study of the collected specimens and thorough perusal of relevant literature (Pullaiah 2015, Reddy and Reddy 2016, Reddy 2018) revealed that the above five species are additions to the Telangana State of India.

Materials and methods

Intensive and extensive floristic surveys were conducted between 2012 and 2022 in the Amrabad Tiger Reserve, Telangana. The plant specimens were collected at different locations with GPS coordinates. The herbarium specimens prepared by following the standard herbarium techniques (Jain and Rao 1977) were preserved at Dr. B.R.R. Govt. Degree College, Jadcherla, Telangana. The phenological events of the grasses, habitat, associated plant species and soil type were recorded in the field.

Result and discussion

After a critical study, the specimens were identified as *Arundinella nervosa*, *Enteropogon monostachyos*, *Eulalia phaeothrix*, *Oryza officinalis* and *Panicum fischeri* (Plate 1 & 2). A

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