MEMORANDUM OF UNDERSTANDING (MOU)
Between
Dr. B.R.R.GOVERNMENT DEGREE COLLEGE, JADCHERLA
and
DEPARTMENT OF BOTANY, OSMANIA UNIVERSITY, HYDERABAD.

This Memorandum of Understanding (herein after referred to as 'MOU') entered on the 10Day of **JULY2018** at Hyderabad by and between: Department of Botany,**Dr. B.R.R.Government Degree College, Jadcherla, Mahabubnagar District**accredited with NAAC "B^{++}" grade,herein after referred as the first party,**Department of Botany, Osmania University, Hyderabad**herein after referred to as the Second Party.

The First Party and the Second Party hereby agree as under:

Provisionof academicand Research activities to the M. Sc and Ph.D students of Department of Botany and both organizations.

(Content of MOU should be mentioned here)

Objectives:

1. Provisionof teaching and research facilities in Botany and Environmental Sciences.
2. Provision of lab facilities by allowing the students of both organizations to the labs.
3. Exchange of students for Internships, Project Works and Research Works between both institutions.
4. Exchange of ideas, indigenous plants for development of Botanical Gardens in both the institutions.
5. Exchange of plant materials for research purpose between both institutions.
6. Exchange of faculty as Resource Persons for Seminars/Conferences/Workshops and other activities.

TERMS OF MOU:

1. **Duration of MOU**:This MOU shall be effective from the date of signing and shall remain in force for a period of 5 years from the said date.

2. **Termination of MOU:** The partnership covered by this MOU shall terminate on completion of the stipulated period. The agreement may also be terminated by the Principal, **Dr. B.R.R.Government Degree College, Jadcherla**with a written one month notice to the **Head, Department of Botany, Osmania University, Hyderabad**in the event of non-compliance.

3. **FINANCE: Both the organizations** shall not pay any fees associated with the participation of any academic activities and research activities in the provision of their lab facilities and other research facilities.

4. Both parties assure that this agreement does not go against the rules and regulations (As both institutions are in Government Entity)

5. If this agreement goes against rules & regulations at a later date and whenit comes into light, the agreement will stand nullified automatically or will be cancelled immediately by the Principal of **Dr.BRR GOVERNMENT DEGREE COLLEGE, JADCHERLA orHead, Department of Botany, Osmania University, Hyderabad.**

For and onbehalfof
Dr.BRR Government Degree College
JadcherlaHyderabad

Dr. B. SADASIVAIAH
Assistant Professor of Botany
Dr. B.R.R. Government College
JADCHERLA.

Forand on behalfof
Department of Botany, Osmania University
Hyderabad

Professor & Head
Department of Botany
University College of Science
O.U Hyderabad-500 007

Department of Botany, Dr. BRR Government Degree College, Jadcherla

MOU

Osmania University

Awareness program

On

Biological Science-Research &Research opportunities

21-06-2023

As a part of MoU with Osmania University, the Department of Botany, Dr. BRR Government Degree College, Jadcherla held a presentation on "Biological Science - Research and Research Opportunities." under the chairmanship of B. Ravinder Rao, the college's vice principal an invited speaker is retired Osmania University Professor Nirmala Baburao. In addition to the potential in numerous disciplines in the modern world, she underlined the necessity of the research field. Students will be able to present solutions to a wide range of issues, according to her, if they are inclined toward research at their degree level and continue in that direction.

According to three research students from Osmania University's Botany Department, the Telangana Botanical Garden, Biodiversity Research Laboratory, and Telangana State Herbarium Center are extremely helpful to them in carrying out their research. The three students who just got their doctorates, according to Dr. B. Sadasivaiah, are evidence of the Department's ongoing research efforts. The faculty members including P.Srinivasulu, the head of the Department of Botany K.Latha have been felicitated. Research Scholars Ramadevi, Rahul, and PhD recipients Dr.S. Kalpana, Dr. Shankar, and Dr.Ramakrishna. Participants in this program.

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Press Coverage

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సుస్థిరాభివృద్ధికి పరిశోధనలే కీలకం - ప్రా. నిర్మలాబాబురావు

జడ్చర్ల మేజర్ న్యూస్ : సుస్థిరాభివృద్ధికి పరిశోధనలే కీలకమని ప్రొ. నిర్మలాబాబురావు అన్నారు. డా. బూర్గుల రామకృష్ణారావు ప్రభుత్వ డిగ్రీ కళాశాల జడ్చర్ల వృక్ష శాస్త్ర విభాగం ఆధ్వర్యంలో జీవ శాస్త్రంలో పరిశోధనలు, పరిశోధన అవకాశాలుపై బుధవారం అవగాహన కార్యక్రమం నిర్వహించారు.కళాశాల వైస్ ప్రిన్సిపల్ బి. రవీందర్ రావు అధ్యక్షతన నిర్వహించిన ఈ కార్యక్రమంలో ఉస్మానియా యూనివర్సిటీ వృక్షశాస్త్ర విశ్రాంత ఆచార్యులు నిర్మల బాబురావు మాట్లాడుతూ నేటి పోటీ ప్రపంచంలో వివిధ రంగాలలో ఉండే అవకాశాలతో పాటు పరిశోధనా రంగం యొక్క ఆవశ్యకతను వివరించారు. విద్యార్థులు డిగ్రీ స్థాయిలో ఉన్నప్పటి నుంచి పరిశోధన పైపు మొగ్గుచూపి ఆ దిశగా ప్రయాణం చేసినప్పుడు ఎన్నో సమస్యలకి పరిష్కారం చూపించడానికి వీలు అవుతుందన్నారు. ఈ సందర్భంగా ఉస్మానియా యూనివర్సిటీ వృక్షశాస్త్ర విభాగం లోని ముగ్గురు పరిశోధన విద్యార్థులు డా.బూర్గుల రామకృష్ణారావు ప్రభుత్వ డిగ్రీ కళాశాల వృక్ష శాస్త్ర విభాగం లోని బయోడైవర్సిటీ రీసెర్చ్ అండ్ ఎడ్యుకేషన్ సెంటర్‌లో పరిశోధనలు చేశారన్నారు. తెలంగాణ బొటానికల్ గార్డెన్, తెలంగాణ రాష్ట్ర హెర్బేరియం సెంటర్ ఎంతగానో వారికి ఉపయోగపడిందని తెలిపారు. డిగ్రీ కళాశాలలో ఉన్న తెలంగాణ బొటానికల్ గార్డెన్, జీవవైవిధ్య పరిశోధక ప్రయోగశాల, హెర్బేరియం సెంటర్లు పరిశోధక అధ్యయనాలకు కావలసిన అన్ని వసతులను కలిగి ఉన్నాయని, పరిశోధక విద్యార్థులకు ఇది ఒక ఆయువుపట్టుగా మారింది అనడానికి ఇటీవల డాక్టరేట్ పట్టా పొందిన ముగ్గురు విద్యార్థులే నిదర్శనమని అన్నారు. కళాశాల నుండి చారి పరిశోధనకు అవకాశం ఇచ్చిన ప్రిన్సిపల్ కి, సహకరించిన డా. బి. సదాశివయ్యని సన్మానించారు. ఈ సందర్భంగా డా. బి.సదాశివయ్య మాట్లాడుతూ భవిష్యత్ లో విద్యార్థులు పరిశోధనను కెరీర్ గా ఎంచుకోవాలి అని సూచించారు. వృక్షశాస్త్ర విభాగాధిపతి శ్రీనివాసులు మాట్లాడుతూ విద్యార్థులలో ఆసక్తి పెరగాలంటే విషయ జ్ఞానంతో పాటు వివిధ అంశాలపై అవగాహన కలిగి ఉండాలన్నారు. అనంతరం ముఖ్య అతిథి అధ్యాపకులను సత్కరించారు. ఈ కార్యక్రమంలో అధ్యాపకులు డా. కల్పన, డా. శంకర్, డా. రామకృష్ణ, ప్రభాకర్ గౌడ్, లత, భార్గవి లత, పరిశోధక విద్యార్థులు రమాదేవి, రాహుల్, విద్యార్థులు పాల్గొన్నారు.

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పరిశోధన రంగం సుస్థిరాభివృద్ధికి కీలక మెట్టు

- ప్రొఫెసర్. నిర్మలాబాబురావు

జడ్చర్ల జూన్ 21 ప్రజా సాక్షి:

డా. బూర్గుల రామకృష్ణారావు ప్రభుత్వ డిగ్రీ కళాశాల జడ్చర్ల వృక్ష శాస్త్ర విభాగం ఆధ్వర్యంలో జీవ శాస్త్రంలో పరిశోధనలు, పరిశోధన అవకాశాలు పై అవగాహన కార్యక్రమంను బుధవారం నాడు నిర్వహించారు. కళాశాల వైస్ ప్రిన్సిపల్ బి. రవీందర్ రావు ఈ కార్యక్రమానికి అధ్యక్షత వహించారు. ఏ దేశము సుస్థిరాభివృద్ధికి చెందలన్నా పరిశోధనా రంగంలో జరిగే పరిశోధనలు కీలక మెట్టు అని. విద్యార్థులు పరిశోధనల వైపు ఆసక్తి కలిగి ఉండాలని ఈ కార్యక్రమానికి ముఖ్య వక్తగా వచ్చిన ఉస్మానియా యూనివర్సిటీ వృక్షశాస్త్ర విశ్రాంత ఆచార్యులు నిర్మల బాబురావు పేర్కొన్నారు. ఈ సందర్భంగా ఆమె మాట్లాడుతు నేటి పోటి ప్రపంచంలో వివిధ రంగాలలో ఉండే అవకాశాలతో పాటుగా పరిశోధనా రంగం యొక్క ఆవశ్యకతను వివరించారు. విద్యార్థులు డిగ్రీ స్థాయిలో ఉన్నప్పటి నుంచి పరిశోధన వైపు మొగ్గుచూపి ఆ దిశగా ప్రయాణం చేసినప్పుడు ఎన్నో సమస్యలకి పరిష్కారం చూపించడానికి వీలు కలుగుతుందన్నారు. ఉస్మానియా యూనివర్సిటీ వృక్షశాస్త్ర విభాగం లోని ముగ్గురు పరిశోధన విద్యార్థులు డా.బూర్గుల రామకృష్ణారావు ప్రభుత్వ డిగ్రీ కళాశాల వృక్ష శాస్త్ర విభాగం లోని బయోడైవర్సిటీ రీసెర్చ్ అండ్ ఎడ్యుకేషన్ సెంటర్ లో పరిశోధనలు చేశారన్నారు. తెలంగాణ బొటానికల్ గార్డెన్ మరియు తెలంగాణ రాష్ట్ర హెర్బేరియం సెంటర్ ఎంతగానో వారికి ఉపయోగపడిందని తెలిపారు. డిగ్రీ కళాశాలలో ఉన్న తెలంగాణ బొటానికల్ గార్డెన్, జీవవైవిధ్య పరిశోధక ప్రయోగశాల మరియు హెర్బేరియం సెంటర్లు పరిశోధక అధ్యయనాలకు కావలసిన అన్ని వసతులను కలిగి ఉన్నాయని పరిశోధక విద్యార్థులకు ఇది ఒక ఆయువుపట్టుగా మారింది అనడానికి ఇటీవల డాక్టరేట్ పట్టా పొందిన ముగ్గురు విద్యార్థులే నిదర్శనమని అన్నారు. ఈ సందర్భంగా కళాశాల నుండి వారి పరిశోధనకు అవకాశం ఇచ్చిన ప్రిన్సిపల్ గారికి, సహకరించిన డా. బి. సదాశివయ్య గారిని సన్మానించారు. ఈ సందర్భంగా డా. బి. సదాశివయ్య మాట్లాడుతూ భవిష్యత్ లో విద్యార్థులు పరిశోధనను కెరీర్ గా ఎంచుకోవాలి అని సూచించారు. వృక్షశాస్త్ర విభాగాధిపతి శ్రీనివాసులు మాట్లాడుతూ విద్యార్థుల లో ఆసక్తి పెరగాలంటే విషయ జ్ఞానంతో పాటు వివిధ అంశాలపై అవగాహన కలిగి ఉండాలన్నారు. అనంతరం ముఖ్య అతిథి అధ్యాపకులను సత్కరించారు. ఈ కార్యక్రమంలో డా. కల్పన, డా. శంకర్ మరియు డా. రామకృష్ణ ప్రభాకర్ గౌడ్. అధ్యాపకులు లత, భార్గవి లత, పరిశోధక విద్యార్థులు రమాదేవి, రాహుల్ మరియు విద్యార్థిని విద్యార్థులు పాల్గొన్నారు.

Press Coverage

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S.No	NAME	HALL TICKET NUMBER	SIGNATURE
1)	P. Ashwini	2203300644452084	
2)	K. Nandini	2203300644451033	
3)	K. Geetha	2203300644452045	K. Geetha
4)	K. Pravallika	2203300644451035	K. Pravallika
5)	B. Shivarani	2203300644452007	B. Shivarani
6)	A. Suhasini	2203300644452001	A. Suhasini
7)	B. Rajeshwari	2203300644452015	B. Rajeshwari
8)	K. Srivani	2203300644451034	
9)	V. Gayathri	2203300644452102	V. Gayathri
10)	M. Jhansi Rani	2203300644452065	M. Jhansi Rani
11)	T. Anusha	2203300644452098	T. Anusha
12)	M. Vennela E/M	2203300644451041	M. vennela
13)	M. Anusha E/M.	2203300644451040	M. Anusha.
14)	D. Shilpa	2203300644452027	D. Shilpa
15)	B. Nandini	2203300644452011	B. Nandini
16)	P. Shobha	2203300644452081	P. Shobha
17)	B. Geetha	2203300644452014	B. Geetha
18)	C. Nikhitha	2203300644452025	C. Nikhitha
19.	K. Pooja	2203300644452054	K. Pooja
20	K. Swapna	2203300644451036	K. Swapna
21	B. Prashanth	2203300644452011	
22	B. Shravya	2203300644452016	B. Shravya
23	G. Keshamma	2203300644452031	G. Keshamma
24.	P. Manasa	2203300644452076	P. Manasa
25	D. Anitha	2203300644452026	D. Anitha
26.	B. Sujatha	2203300644451072	B. Sujatha
27.	K. Akhila	2203300644452050	K. Akhila
28.	S. Pandidevi	2203300644452089	S. Pandidevi
29.	C. Sangeetha	2203300644452024	C. Sangeetha
30	K. Shirisha	2203300644452049	K. Shirisha
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RESEARCH ARTICLE

Addition of five grass species to the state of Telangana

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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

Introducation

Telangana state is situated in the central stretch of the eastern seaboard of the Indian Peninsula with an area of 114,840 km^2 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 hillspossess moist deciduous, dry deciduousand 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; 2021a,b,c; Nagaraju & Annamma 2021; Nagaraju and Bharath 2021, Swamy andNagaraju 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 specimensand 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.

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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, Jadcharla, 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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Euphorbia telanganensis (Euphorbiaceae), a new species from Eastern Ghats of Telangana, India

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Abstract

Euphorbia telanganensis (Euphorbiaceae), a new species is described and illustrated from dry deciduous forest of Amrabad Tiger Reserve, the Eastern Ghats of Telangana state. The present new species is similar to *Euphorbia jodhpurensis* but differs in obovate or elliptic-obovate or ovate-elliptic, abaxillay pubescent leaves, 1.5–2.2 mm long peduncle, turbinate involucre, ellipsoid glands, unequal gland limbs, shallowly undulate posterior limbs, capsules deeply keeled, and trigonous.

Key words: Flora of India, Nagarkurnool district, Euphorbia subg. Chamaesyce, sect. Anisophyllum, subsect. Hypericifoliae

Introduction

Euphorbia Linnaeus (1753: 450) is one of the largest genera in the family Euphorbiaceae and also the sixth largest genus among the angiosperms with about 2000 species distributed throughout the world with highest diversity found in arid and semi-arid regions of the tropics and sub-tropics (Mabberley 2017, Malpure *et al.* 2021a). In India, the genus is represented by 92 species of which 39 are endemic (Binojkumar & Balakrishnan 2010, Sarojinidevi 2017, Sarojinidevi & Raju 2014, Sarojinidevi & Swamy 2018, Prasad & Prasanna 2016, Malpure *et al.* 2016, Malpure *et al.* 2021a,b, Swamy & Prasad 2022). The genus includes geophytes, herbs, shrubs, trees, and a host of succulent and xerophytic forms and is characterized by distinctive morphological synapomorphy, the cyathium inflorescence (Horn *et al.* 2012).

During recent floristic explorations in the Amrabad Tiger Reserve from the Eastern Ghats of Telangana state, authors have collected interesting population of *Euphorbia*. After critical examination of the specimens, it is revealed that characters like non-succulent and leafy herb, presence of interpetiolar stipules, opposite leaves which have oblique base, presence of unequal petaloid appendages subtending the cyathial glands and ecarunculate seeds confer its position in the subgenus Chamaesyce Rafinesque (1817: 119), sect. Anisophyllum Roeper (1828: 412), subsect. Hypericifoliae Boissier (1862: 20) (Boissier 1862, Binojkumar & Balakrishnan 2010, Yang *et al.* 2012). This subsection is consisting of 365 species and have worldwide distribution (Yang *et al.* 2012). In India, subgenus Chamaesyce is represented by 31 species (Binojkumar & Balakrishnan 2010, Sarojini & Raju 2014) including recently described species, *Euphorbia kadapensis* Sarojinidevi & Venkataraju (2014: 179). Collected specimens were morphologically similar to *Euphorbia jodhpurensis* Blatter & Hallberg (1920: 971) but distinct in certain characters, and hence it is recognized as a new species which is described and illustrated below.

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Research article

Chrysopogon hamiltonii (Hook.f.) Haines (Poaceae: Andropogoneae) - Addition to the flora of Telangana, India

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Abstract: The present study is the addition of *Chrysopogon hamiltonii* from Poaceae as a new record to the grass flora of Telangana. In addition to this, ecology and distribution have been provided.

Keywords: Distribution - Ecology - New record - Poaceae.

[Cite as: Sadasivaiah B, Ramakrishna A & Rao NB (2022) *Chrysopogon hamiltonii* (Hook.f.) Haines (Poaceae: Andropogoneae) - Addition to the flora of Telangana, India. *Tropical Plant Research* 9(2): 55–58]

INTRODUCTION

The genus *Chrysopogon* Trin., comprises ca. 48 species, distributed in tropical and subtropical regions of the Old World to Pacific, South-central and Southeast North America, and Cuba in the Carribean (Clayton *et al.* 2006 onwards). In India, it is represented by 23 species (Kellogg *et al.* 2020, Prasanna *et al.* 2020, Nagaraju *et al.* 2021) and 14 species were reported in the Eastern Ghats (Pullaiah 1997, Kabeer & Nair 2009, Pullaiah & Karuppusamy 2020). Among 14 species recorded from Eastern Ghats, 12 are reported from Andhra Pradesh; 6 are from Odisha (Saxena & Bramham 1996), 9 species from Tamil Nadu (Kabeer & Nair 2009) and 3 species from Telangana (Pullaiah 2015, Reddy & Reddy 2016) and recently *Chrysopogon serrulatus* added to the flora of Telangana by Nagaraju *et al.* (2021).

During the floristics explorations of Telangana state, the authors collected specimens of an interesting grass species from Amrabad Tiger Reserve, Nallamalais, Nagarkurnool district, Telangana. After a critical study, it was identified as *Chrysopogon hamiltonii* (Hook. f.) Haines of Poaceae. The perusal of relevant literature (Pullaiah 2015, Reddy & Reddy 2016) revealed that this species was not reported from Telangana. Hence, the present collection of *Chrysopogon hamiltonii* from Telangana is a new distributional record to the flora of Telangana state. A detailed description and photo plate are provided to facilitate its easy identification.

MATERIALS AND METHODS

An intensive and extensive floristic survey was conducted from 2012 to till date in the Eastern Ghats of Telangana. The plant specimens were collected at Jalpenta and Pedda Uty areas of Kollapur Range, Amrabad Tiger Reserve and made herbarium following the standard method (Jain & Rao 1977). The mounted specimens were identified with the help of available literature (Pullaiah & Karuppusamy 2020). The phenological record of the plants, habitat and associated species were noted. Herbarium specimens were deposited at Telangana State Herbarium (TBGH), Dr. B.R.R. Government Degree College, Jadcherla for future reference.

OBSERVATIONS AND RESULTS

After a critical study, the specimens were identified as *Chrysopogon hamiltonii* (Hook. f.) Haines (Fig. 1). A scrutiny of relevant literature has revealed that the species is not reported from Telangana state (Pullaiah 2015, Reddy & Reddy 2016, Reddy 2018). Hence, the present distribution of this grass species forms new distributional record for the Telangana State. Rao *et al.* (2012) reported the present species as new distributional record for South India, but it was collected from Samrajyam Konda near Gorantla, presently which is in Andhra Pradesh State.

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RESEARCH ARTICLE

Elatostema J.R. fort. & G. Fort. (Urticaceae): a new generic record to the flora of Telangana, India.

B. Sadasivaiah, L. Paramesh[1], A. Ramakrishna and T. Pullaiah[2]

Abstract: *The genus Elatostema* J.R. Forst. & G. Fort. *belongs to Urticaceae family is collected from Uma Maheshwaram sacred grove of Nallamala forest, Amarabad Tiger Reserve, Telangana and reported here as an addition to Flora of Telangana State.*

Key words: *Elatostema*, Uma Maheshwaram, New Record, Telangana, Urticaceae.

Introduction

The genus *Elatostema* J.R. Forst. & G. Forst. belongs to the family Urticaceae and it is distinguished from the other genera of Urticaceae by having capitula inflorescences with receptacles and involucres (Yang *et al.* 2011). The genus comprises ca.350 species including herbs, small shrubs and subshrubs (Wang, 2012) that grow in deep shade in forests, gorges, stream sides and caves distributed in tropical to subtropical regions of Africa, Asia, Australia and Oceania. In India, the genus is represented by 49 taxa including 40 species and 9 varieties (Murti and Pusalkar 2020).

Materials and methods

While working on the documentation floristic composition of Amrabad Tiger Reserve in Telangana state, the authors collected few interesting semi aquatic plant species of Urticaceae family on the rock crevices of Uma Maheshwaram sacred grove (16°22'15.89" N, 78°43'55.55" E), Nagar Kurnool district, Telangana state, in August 2019. After a critical study, the specimens were identified as *Elatostema cuneatum* Wight based on available literature. The specimens were preserved in the herbarium of BRR Government College, Jadcherla, Mahabubnagar district.

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Observations and results

The scrutiny of literature revealed that the family Urticaceae comprises only 4 genera in Telangana state namely *Boehmeria* Jacq., *Girardinia* Gaud., *Pilea* Lindl., *Pouzolzia* Gaud. (Pullaiah 2015, Reddy and Reddy 2016) and recently the genus *Laportia* was added as new distributional record to the flora of Telangana (Kalpana *et al.* 2016). The presence of genus *Elatostema* J.R. Forst. & G. Forst. is hitherto not found hence, it was reported here as new generic record to state along with detailed description, distribution, location map and plant photos for its easy identification.

Taxonomic treatment

Elatostemma cuneatum Wight Ic. 6: 35. t. 2091. f. 3: 1888. 1853 (*cuniata*); FBI 5: 568. 1888. Fischer 3: 1377. 1928.

Annual herbs, up to 10 cm high, more or less pubescent. Stem simple or scarcely branched, triangular, rooting at base. Leaves opposite, base cuneate, margin dentate or crenate, apex rounded

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Species

23(71), 2022

Four endemic Euphorbiaceae taxa additions to Telangana state, India

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ABSTRACT

An endangered and endemic taxon *Phyllanthus narayanswamii* 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. *nallamalayana* (J.L. Ellis) V.S. Raju and *Euphorbia senguptae* 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 Palni 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 (Binojkumar & Balakrishnan 2010; Sarojinidevi, 2017; Malpure, 2021). Cyathium is the general character of the Tribe Euphorbieae. The cyathium is actinomorphic bearing a ring of broken glands at the rim of the involucral cup, a solitary exserted or included naked pistillate floret in the central position of the cup bearing a single 3-loculed ovary with one ovule in each locule. Several aggregated fascicles of staminate florets surround the pistillate floret; each consisting of a pedicel and a ring of filiform bracteoles or solitary bracteole at the junction of pedicel and filament. This type of inflorescence is unique and found only in this group.

Phyllanthaceae is one of the five segregated families of Euphorbiaceae s.l. recognized by Angiosperm Phylogenic Group (Hoffmann *et al.*, 2006), which contains around 2099 species belonging to 58 genera (POWO, 2021). The genus *Phyllanthus* L. is one of the largest genera of the family Phyllanthaceae with around 880 species (Bouman *et al.*, 2018) distributed throughout the tropics mainly in dry deciduous forests (Gautam & Adhikari, 2021; Naik et al., 2020). In India, the genus *Phyllanthus* is represented with more than 50 species (Mathew, 2021) among them, 17 species were recorded in Telangana state.

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Occurrence Of *Chrysopogon velutinus* (Hook. F.) Bor (Poaceae: Andropogoneae) in Eastern Ghats of Telangana

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तेलंगाना के पूर्वी घाटों में *क्रिसोपोगोन वेलुटिनस* (हुक.एफ.) बोर (पोएसी: एंड्रोपोगोनि का उपलब्धता

अवुला रामाकृष्णा, बायल्ला सदासिवाइह, गोरेलारमादेवी, सिद्दाबथूला नागराजु, निर्मला बाबू राव

सारांश

क्रिसोपोगोन वेलुटिनस (हुक.एफ.) बोर, एक स्थानिक घांस है जिसे तेलंगाना के पूर्वी घाटों से अलग एक भिन्न क्षेत्र से प्राप्त किया गया है। संक्षिप्त विवरण तथा छाया चित्र इस शोध के साथ प्रादान किया गया है ताकि आसानी से इसका पहचान किया जा सके।

ABSTRACT

Chrysopogon velutinus (Hook.f.) Bor, an endemic grass collected from other than type locality in Eastern Ghats of Telangana, India. Brief description key and photographs were provided for easy identification.

Keywords: Eastern Ghats, Endemic, Grass, New Record, Poaceae, Type locality

INTRODUCTION

The Eastern Ghats were well explored by the botanists from 18th century onwards like William Roxburgh, Robert Wight, Elliot, Beddome, Gamble, Lushington and few others. Robert Wight, a medical practitioner who visited India in the early 18th century and stayed 35 years in India. He made extensive collections in southern Peninsular India including present state of Andhra Pradesh. He described 38 genera and more than 3000 species of Indian plants, *Chrysopogon velutinus* is one among them and it was named by Arnott.

The genus *Chrysopogon* Trin., comprises ca. 48 species, distributed in tropical and subtropical regions of the Old World to Pacific, South central and Southeast North America, and Cuba in the Carribean (Clayton et al, 2006 onwards). In India, it is represented by 23 species (Kellogg et al, 2020; Prasanna et al, 2020; Nagaraju et al, 2021) and 14 species were reported in in Eastern Ghats (Pullaiah, 1997; Kabeer & Nair, 2009; Pullaiah & Karuppusamy, 2020). Among 14 species recorded from Eastern Ghats, 12 are reported from Andhra Pradesh; 6 are from Odisha (Saxena & Bramham, 1996), 9 species from Tamil Nadu (Kabeer & Nair, 2009) and 3 species from Telangana (Pullaiah, 2015; Reddy & Reddy, 2016) and recently *Chrysopogon serrulatus* added to the flora of Telangana by Nagaraju el al (2021).

MATERIALS AND METHODS

An intensive and extensive floristic survey was conducted from 2012 to till date in the Eastern Ghats of Telangana. The plant specimens were collected at different locations and made herbarium following the standard method (Jain & Rao, 1977). The mounted specimens were identified with the help of available literature (Pullaiah & Karuppusamy, 2020). The phenological

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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, Chloroxylon swietenia, Diospyros melanoxylon, Givotia moluccana, Buchanania axillaris, Terminalia alata, Sterculia urens, Strychnos nux-vomica, Bombox ceiba, Butea monosperma, Madhuca indica, Eriolaena lushingtonii, Albizia odoratissima, Terminalia bellirica, Pterocarpus marsupium, Firmiana colorata, Careya arborea* in Amrabad Tiger Reserve, Telangana, India. The phenological observations include leaf flush, leaf mature, leaf fall, leaf less periods, flowering, fruiting, fruit fall, among the selected tree species. A total of ten individuals (≥50 cm gbh), 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, Fruiting 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 fruiting, 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 flesh, 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 phonological 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 pheonological 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