

3.3.2 Number of research papers per teachers in the Journals notified on UGC website during the last five years (10)

Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	ISSN number	Link to the recognition in UGC enlistment of the Journal /Digital Object Identifier (doi) number		
						Link to website of the Journal	Link to article/paper/abstract of the article	Is it listed in UGC Care list/Scopus/Web of Science/other, mention
'भारत का गहराता कृषि संकट और किसानों की आत्महत्याएं' (पुस्तिका)	सियाराम शर्मा	Hindi	'साम्य', पुस्तिका-17 सं. -विजयगुप्त, ब्रह्म रोड, अम्बिकापुर-497001, सरगुजा (छ. ग.)	2015				
'तुम्हीं कहो कि यह अन्दाज़-ए-गुप्तगू क्या है	सियाराम शर्मा	Hindi	'अकार', सं.-प्रियंवद, 15/269, सिविल लाइन्स, कानपुर-208001 (उ.प्र.)	2015				
पराधीनता के खोल से बाहर प्रमाण करती स्त्री	डॉ. रीता गुप्ता	Hindi	रिसर्च लिंक	2015	973-1628			
समकालीन कवयित्री अनामिक कि काव्य में स्त्री विमर्श	डॉ. रीता गुप्ता	Hindi	रिसर्च लिंक	2015	0973-1628			
Environmental awarness among students	Dr. Usha Sahu, Dr. Madhulika Roy	Zoology	Int. J. Pharmacol Bio.Sci.	2015	ISSN0973-6808			
Testing and Evaluation adopted for the course proposed for first semester Engineering college students of CSVTU	Dr. A.A. Khan	English	International Journal of english language, literature and humanities (IJELLH)	2015	ISSN2321-7065			

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Use of video in ELT for material development	Dr. A.A. Khan	English	Review of research	2015	ISSN2249-894X			
Course Design and material development in teaching of english: A report on the course proposal for first semester engineering college students of CSVTU	Dr. A.A. Khan	English	International Journal of english language, literature and humanities (IJELLH)	2015	ISSN2321-7065			
COMPARATIVE STUDY OF APPLICATION OF CHEMICAL AND BIOFERTILIZER FOR BETTER GROWTH OF Vitex, A MEDICINAL PLANT)	NIHARIKA DEWANGAN, RANJANA SHRIVASTAVA AND A. K. SHRIVASTAVA	Botany	Indian J.L.Sci.	2015	ISSN: 2277-1743 (Print) ISSN: 2278-7879 (Online) vol 5(1): 041-043,	https://www.ijls.in/	Print edition	yes
SECONDARY METABOLITES AND ETHNOMEDICINAL IMPORTANCE OF FEW LEAFY VEGETABLES USED BY TRIBAL PEOPLE OF CHHATTISGARH.	Chauhan, Deepti; Shrivastava, A. K.; Patra, Suneeta	Botany	International Journal of Pharmacology & Biological Sciences.	2015	Issn0973-6808	http://aptjournals.com/	Print edition	yes

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						Link to website of the Journal	Link to article/paper/abstract of the article	Is it listed in UGC Care list/Scopus/Web of Science/other, mention
Diversity of Actinomycetes in Parboiled rice mill effluent	Charulata Philip, Awadhesh Kumar Shrivastava and ranjana Shrivastava	Botany	IOSR journal of environmental science toxicology and food technology (IOSR-JESTFT) e-ISSN No. 2319-2402, p- vol.9, issue 6 ver. III (June 2015), pp 07-13.	2015	ISSN No. 2319-2399	http://www.iosrjournals.org/iosr-jestft/papers/vol9-issue6/Version-3/B09630713.pdf	https://www.iosrjournals.org/iosr-jestft/papers/vol9-issue6/Version-3/B09630713.pdf	yes
Co-inoculation of <i>Azotobacter</i> and <i>Pseudomonas</i> to improve growth of rice (<i>Oryza sativa</i>).	RANJANA SHRIVASTAVA, NIHARIKA DEWANGAN, A.K. SHRIVASTAVA	Botany	<u>Indian Journal of Tropical Biodiversity</u> Vol.23 No.1 pp.98-101 ref.22	2015	<u>ISSN : 0971-4642</u>	https://www.journalguide.com/journals/indian-journal-of-tropical-biodiversity	Print edition	yes
Administrative role of Headman in British states (Special reference to Bastar and Rajnandgaon riyasat)	Anusueya Jogi and C.R. Patel	History	SHODHAK	2015	ISSN 0302-9832			
'सत्ता के साथ सत्य के निर्णायक युद्ध के कवि'	सियाराम शर्मा	Hindi	'सापेक्ष', सं.-महावीर अग्रवाल, ए-14, आदर्शनगर, दुर्ग (छ.ग.)	2016				

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'किसान केन्द्रित कविताओं पर हावी मध्यवर्गीय दृष्टि'	सियाराम शर्मा	Hindi	'अकार', सं.-प्रियंवद, 15/269, सिविल लाइन्स, कानपुर-208001 (उ.प्र.)	2016				
'आलोचना के मूल में सक्रिय वर्ग दृष्टि'	सियाराम शर्मा	Hindi	'समकालीन जनमत', सं.-रामजी राय, 171, कर्नलगंज, इलाहाबाद-211002 (उ.प्र.)	2016				
समाजिक सरोकार और आज का व्यंग	डॉ. रीता गुप्ता	Hindi	समसामयिक साहित्य चिन्तन और चुनौतियाँ	2016				
Gender Issues in the Novels of Chitra Banerjee Devkarumi	Dr. A.A. Khan	English	International Journal of Engineering Technology Sciences and Research (IJETSR)	2016	ISSN2394-3386			
Uses of weeds as Medicine in Durg District of Chhattisgarh	A. K. Shrivastava; S. Patra and A. Tikariha	Botany	Indian J. Applied & Pure Bio. Vol. 31(1), pp 91-104 (2016)	2016	ISSN0970-2091	http://biology-journal.org/contact-info.html	print edition	yes
Phytosociological analysis of weeds in DURG DISTRICT of Chhattisgarh	Anita Tikariha A.K.Shrivastva and S. Patra	Botany	IOSR journal of environmental science toxicology and food technology-CSIR	2016	eISSN No. 2319-2402,	http://www.iosrjournals.org/iosr-jestft/papers/vol10-issue10/Version-3/C1010031421.pdf		yes

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‘पूँजीवादी कृषि के अन्तर्विरोध	सियाराम शर्मा	Hindi	‘सब लोग’, सं.–किशन कालजयी, बी.–3 / 44, प्रथम तल, सेक्टर–16, रोहिणी, दिल्ली–110089	2017				
‘आलोचना के मूल में सक्रिय वर्ग दृष्टि’	सियाराम शर्मा	Hindi	‘दुनिया इन दिनों सं.–डॉ. सुधीर सक्सेना, 81/2, चौथी मंजिल, अदवीनी, अरविन्दो मार्ग, दिल्ली–110017	2017				
वैश्विक सामाजिक परिपेक्ष्य और रामकथा	डॉ. रीता गुप्ता	Hindi	नव निकष	2017	975827			
Spiritual and Practical Dimensions in the few selected novels of Graham Greane.	Dr. A.A. Khan	English	International Journal of english language, literature and humanities (IJELLH)	2017	ISSN2321-7065			
Biochemical studies of weed plants used as leafy vegetables by tribes and peoples of Chhattisgarh with special reference to the secondary metabolites confer nutraceutical properties.	A.K.Shrivastava, Suneeta Patra and Deepti Chauhan	Botany	Indian journal of applied and Pure biology	2017	ISSN 0970-2091	http://biology-journal.org/contact-info.html	http://www.biology-journal.org/fulltext/v32i1/ijapb32-1-4.pdf	yes

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'लोकतंत्र में विचारों की कमी और विचारकों की हत्याएँ'	सियाराम शर्मा	Hindi	'दक्षिण कौशल', सं.-उत्तम कुमार, तथागत सिद्धार्थ पैलेस, समता कॉलोनी, पनेका, जिला-राजनांदगाँव (छ.ग.) 491441	2018				
'लोकतंत्र में विचारों की कमी और विचारकों की हत्याएँ'	सियाराम शर्मा	Hindi	'दक्षिण कौशल', सं.-उत्तम कुमार, तथागत सिद्धार्थ पैलेस, समता कॉलोनी, पनेका, जिला-राजनांदगाँव (छ.ग.) 491441	2018				
'लोकतंत्र में विचारकों की हत्याएँ'	सियाराम शर्मा	Hindi	'अकार', सं.-प्रियंवद, 15/269, सिविल लाइन्स, कानपुर-208001 (उ.प्र.)	2018				
अनुभव की आँच में तपी कविताएँ	डॉ. रीता गुप्ता	Hindi	नव निकष	2018	0975-0827			
सीता के चरित्र में युगीन प्रभाव	डॉ. रीता गुप्ता	Hindi	अक्षर पर्व	2018	22789766			
बुन्देली का प्राचीन साहित्य और साहित्यकार	डॉ. रीता गुप्ता	Hindi	बुन्देलखण्ड संस्कृति एवं साहित्य	2018	2249-930x			
भारत में खाद्यान्न सुरक्षा एक विवेचना	डॉ. शुभा शर्मा	Economics	Anthology the research	2018	ISSN2456-4397			

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Plants used by tribal people of Chhattisgarh for Gynecological disorder	A.K.Shrivastava, P.Bansode and S.Patra	Botany	Indian journal of applied and pure biology	2018	ISSN 0970-2091	http://biology-journal.org/contact-info.html	http://www.biology-journal.org/fulltext/v33i1/ijapb33-1-63.pdf	yes
Secondary metabolites and antioxidants screening of lablab purpureus (L.) sweet in different solvents.	Deepti Chauhan, A.K.Shrivastava and Suneeta Patra	Botany	Advances in Pharmacology and toxicology	2018	ISSN no. 0973-2381 UGC list serial no. 1455.	http://aptjournals.com/	Print edition	yes
Comparative phytochemical analysis of the aqueous leaf extract of some important leafy vegetables from Durg, Chhattisgarh.	Suneeta Patra, A.K. Shrivastava and Anita Tikariya	Botany	Life science bulletin	2018	ISSN no. 2321-7925 (online), ISSN no. 09735453 (print)	https://www.slsjournals.com/	Print edition	yes
Phytochemical analysis of some plants used by tribal peoples of Mohla Manpur area of Chhattisgarh		Botany	National Journal of Life sciences	2018	ISSN No. 0972-995X (Print),2321-7960 (online).	https://www.slsjournals.com/	Print edition	yes

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						Link to website of the Journal	Link to article/paper/abstract of the article	Is it listed in UGC Care list/Scopus/Web of Science/other, mention
Effect of industrial effluents on ecophysiological properties of plants of Bhilai industrial area.	Suneeta Patra, A.K. Shrivastava and Anita Tikariya	Botany	Ambient Science 5 (sp 2) online December . Published by National cave research and protection organization, India ISSN No. 2348-8980 (Print).	2018	ISSN- 2348 5191 (Print version) & ISSN- 2348 8980 (Online	https://www.caves.res.in/journal.php	https://www.researchgate.net/publication/329211569_Effect_of_Industrial_Effluents_on_Ecophysiological_Properties_of_Plants_of_Bhilai_Industrial_Area_India	yes
‘भूमंडल की स्वप्नहीन रात में मुक्तिबोध’	सियाराम शर्मा	Hindi	‘कथा’, सं.–दुर्गा / सस्या, टैमरिन ट्री, शक्तिविहार कॉलोनी, 60–सी, थार्नहिल रोड, इलाहाबाद–1	2019				
‘शहर एक स्त्री की अनुपस्थिति का दूसरा नाम है’	सियाराम शर्मा	Hindi	‘साखी’ सं.–सदानंद शाही, बी. –2, सत्येन्द्र कुमार गुप्त नगर, लंका, वाराणसी 221005 (उ.प्र.)	2019				
‘नामवर सिंह की आलोचना दृष्टि’	सियाराम शर्मा	Hindi	‘साक्षात्कार’ सं.–नवल शुक्ल, साहित्य अकादमी, संस्कृति भवन, बाणगंगा, अयोध्या 221002 (उ.प्र.)	2019				
गजलकार श्रीमती संतोष मांझी	श्रीमती पुष्पलता ‘चन्द्राकर’ डॉ. कोमल सिंह शर्मा	Hindi	‘जिज्ञासा’ – बी.एच.यू. वाराणसी	2019	ISSN 0974-7648			

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मंदाकिनी के काव्य में नारी चेतना	श्रीमती पुष्पलता 'चन्द्राकर' डॉ. कोमल सिंह शर्मा	Hindi	'जिज्ञासा' – बी.एच.यू. वाराणसी	2019	ISSN 0974-7648			
Phytochemical analysis of some plants used by tribal peoples of Mohla Manpur area of Chhattisgarh	Pranita Bansode, Suneeta Patra and A.K. Shrivastava	Botany	Advances in Pharmacology and toxicology	2019	ISSN no. 0973-2381	http://aptjournals.com/	print edition	yes
comparative in vitro antioxidant analysis of three leafy vegetables of Durg district, Chhattisgarh	Deepti Chauhan, A.K.Shrivastava and Suneeta Patra	Botany	studies in India Place Names	2019	ISSN no. 2394-3114	https://publons.com/journal/711480/studies-in-indian-place-names-ugc-care-journal/	https://www.researchgate.net/publication/341344523_COMPARATIVE_IN_VITRO_ANTIOXIDANT_ANALYSIS_OF_THREE_LEAFY_VEGETABLES_OF_DURG_DISTRICT_CHHATTISGARH_INDIA	yes

Course Design and Material Development in Teaching of English: *A Report on the Course proposed for First Semester Engineering College Students at CSVTU*

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Abstract

Teaching English to First Semester Engineering College Students is a challenge. The students of first year college are 17-18 years of age. They have done their Higher Secondary School Certificate (matriculation) before this they had five years of primary education and also Secondary Level (sixth, seventh and eighth years) and Higher Secondary Level (ninth, tenth, eleventh and twelfth years).

The majority comes from regional language medium schools (in Chhattisgarh it is Hindi). So, they have had six years of English at Secondary and Higher Secondary Levels. Those who come from English medium schools (they are not many) have had 12 years of English. In principle, therefore, they come to first year college with sufficient knowledge of the structure of English and they are supposed to understand and express themselves in acceptable English. But in reality, that is not the case. Most students 'do' their English with the main aim to pass their examinations and they are able to do so with the help of ~~exam~~

Testing and Evaluation Adopted for the Course proposed for First Semester Engineering College Students at CSVTU

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Abstract

We as teachers of English do spend a lot of time testing, evaluating and assessing students. Sometimes, it is to measure the students' abilities to see if they are eligible to enter a course or institution. Sometimes, it is to see the progress and sometimes it is because the students themselves want a qualification. Therefore, the assessment is sometimes formal and public and sometimes it is informal and takes place in day-to-day sessions.

This paper illustrates testing, types of tests, characteristics of good test and the evaluation processes in general practiced in ELT and test and evaluation process adopted in particular for the assessment of the students' progress in a course specially designed for first semester Engineering college students at CSVTU to have a workable command of English not only for group discussions, interviews and presentations but also for social standing.

The very idea of a choosing diagnostic test of all the tests is centred on the intentional and planned activity of teaching to assess our students' progress based on their needs and the course objective. For this, we sometimes give them the same test we give them at the start of the Course. The first diagnostic test is usually a 30 minute test and it is administered on the day 1 of the course followed by an informal Chat. The exit level test is given at the end of



USE OF VIDEO IN ELT FOR MATERIAL DEVELOPMENT

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Abstract:- We have always talked about recorded material and audio material only. But of course, we can also bring in video in the form of film clips, DVD or online video extracts for our learners to listen and learn while they watch.

Video have many good reasons for encouraging students to watch while they listen. In the first place, they get to see "language in use". This not only captures their interest but also allows them to internalise a whole lot of paralinguistic behaviour. For example, they can see how intonation matches facial expression and what gestures accompany certain phrases. Video allows learners entry into a new world of communications: they see how different people stand when they talk to each other and at the same time try to mime and learn many things, they also put themselves into different characters and echoes. This first helps the learners to memorize the target language chosen for them through the video.

Keywords: Use of Video, Activities and Tasks-Based Lesson, Material Development through Video Clips and extracts.

INTRODUCTION

Therefore, video extracts can be used as a main focus of a lesson sequence or as parts of other longer sequences. Sometimes we might get learners to watch a whole programme, but at other times they will only watch a short two-or-three-minute sequence. Because learners are used to watching film at home – and may therefore associate it with relaxation – we need to be sure that we provide them with good viewing and listening tasks so that they give full attention to what they are seeing and hearing. But it also a plus point that they never get into a habit of making notes because they have never made notes whenever they watched movies or serials and captures the information and also reproduce it in the form of information packets when required.

Techniques commonly practised in using video in class

Following viewing techniques are designed to awaken the learners curiosity through prediction so that they finally watch the film sequence in its entirety, they will have some expectation about it.

- ❖ **Fast forward:** the teacher presses the play button and then fast forwards the DVD or video so that the sequence shoots past silently and at great speed, taking only a few seconds. When it is over, the teacher can ask students what the extract was all about and whether they can guess what the characters are saying.
- ❖ **Silent viewing (for language):** the teacher plays the film extract at normal speed but without the sound. Students have to guess what the characters are saying. When they done this, the teacher plays it with sound so that they can check to see if they guessed correctly.
- ❖ **Freeze Frame:** at any stage during a video sequence we can 'freeze' the picture, stopping the participants dead in their tracks. This is extremely useful for asking the students what they think will happen next or what the character will say next.

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Abstract

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Spiritual and Practical Dimensions in the few selected novels of Graham Greene

ABSTRACT

Spiritualism may mean differently to different people, but basically spiritualism is a religion with many aspects. It is presented by the authors in their fiction, which also carries an imprint of them by their own experiences in life. Graham Greene is one such author whose creativity as a writer has won him acceptance by people all around the world. At present I have selected two of his most read novels – The Power and the Glory and Brighton Rock for my research article by the first hand reading of the text. They are predominant in religious themes which are pre-occupied by Roman Catholicism. Greene pays back to the English novel the spiritual dimension with different aspects in these novels. Although Greene had tried to show his interest in subjects related to religious matters, yet his characters are found dwelling between belief and disbelief. In the novels of Greene the violence is not there just because it exists in the world, but it is there because violence satisfies that moral craving for reasonable expression of human nature which is left without belief.

Key words: Spiritual, Religious, Faith, belief.

Introduction

Novelists are authors who write fiction and their writings give shape to their own experience with life. Their writings always carry an imprint of their own life in their works. Graham Greene is one such writer who had created a remarkable world called Greenland which consists of Tragedy, Trauma and Conflict. His works always had an element of doubt and this doubt is reflected in some of his works which also have Religion at its centre.

Religious Sense in novel The Power and The Glory

OBSERVATION OF DISEASES DUE TO MICROORGANISM IN JAPANESE QUAILS AT DURG

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ABSTRACT

The present Study of pathological conditions in Japanese quails due to infections were carried out at Durg. Perusal of the available literature revealed more information about the incidence of various pathological alterations in intestine of quails due to microorganisms. The study was focused on ulcerative enteritis and coccidiosis.

KEYWORDS: Japanese quails, Pathological alterations, Ulcerative enteritis, Coccidiosis, Microorganism, Histopathology.

Various pathological alterations were observed in the quails. A total of 304 (i.e. 60.67%) intestines out of 501 samples were found affected with enteritis and coccidiosis. A total of 176 cases of enteritis i.e. 35.12% occurrence were observed in total number of quails observed and 128 (42%) samples have shown the presence of coccidiosis.

MATERIALS AND METHODS

A total of 501 quails of either sex were selected as the material which were obtained from various farms located in and around the Durg district. The age was ranging from one week to twenty-four weeks. Tissues were fixed in 10% buffered formalin for routine histopathology by H&E staining

OBSERVATION

Ulcerative Enteritis

It was observed in 38 quails i.e. 21.59% occurrence was observed.

- Ulcerative Enteritis is an acute, highly contagious disease observed in quails caused by the bacterium Clostridium colinum. It is characterized by ulcers of the intestines and caecae.
- Patchy necrotic areas were seen.
- Lower small intestine showed ballooning and hemorrhagic patches.

Coccidiosis

In the present study 4% mortality was observed in quails during the monsoon months i.e. 20

quails died out of total observation of 501, and 128 samples of intestines were found positive for the presence of Eimeria species, i.e. 49.09% occurrence was noticed. Thickening was observed in the caecal wall. Remarkably, the mid part of intestine showed petechial hemorrhages whereas lower part had congestion.

RESULTS AND DISCUSSION

Incidence of Pathological Conditions with Gross and Microscopical Changes Present study has revealed various pathological alterations in above said tissues intestine. (Table 1, Graph 1&2). The present study showed the maximum number of affections in intestine (60.67%). The present study was focused on ulcerative enteritis (38) and coccidiosis (128).

This study has also indicated that under local conditions a significant number of quails were found affected in Durg district. Several predisposing factors like climatic conditions, environmental factors (like temp, rains, humidity etc.), toxic matters, infectious diseases, pathogens like bacteria, virus, protozoans etc, poor hygienic conditions and inadequate management might be responsible for pathological changes, morbidity and mortality.

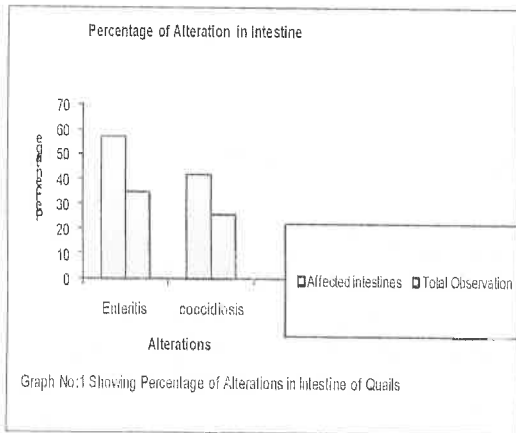
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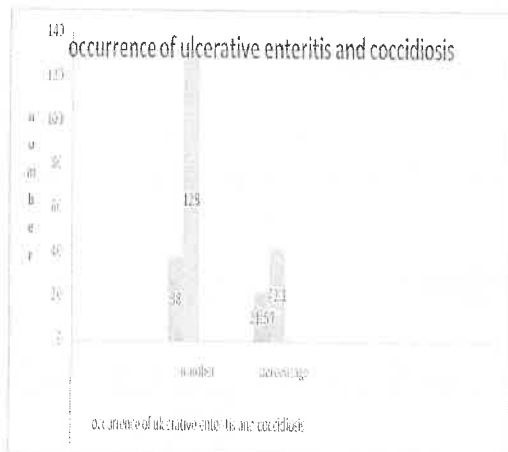
Table 1: Pathological Alterations in Intestine of Quails

Total observation in quails: 501 Total Intestines Affected: 304				
S N	Pathological Condition	No. of Affection	% Out of Affected 304 intestine	Overall % Out of 501
1	Enteritis	176	57.23	34.73
2	Coccidiosis	128	42.10	25.54

Graph 1: Pathological conditions observed in Quail



Graph 2: Number and Percentage of coccidiosis and ulcerative enteritis



DISCUSSION

Many researchers have reported the similar findings from all corners of the world on Japanese quails and on other poultry birds too, which are in accordance with the present findings. Bendel (1976) reported ulcerative enteritis in bob white quails due to bacterial invasions which caused ulcers in intestinal villi. In the present study 21.59% cases out of total observation, were of ulcerative enteritis. Kapoor *et.al.* (1980) reported enteritis in Japanese quails in Izatnagar, due to *Salmonella bareilly*. This study has also found 34.73% occurrence of enteritis. Ritter *et.al.* (1986) and Guy *et.al.* (1987) reported severe intestinal lesions and high mortality rate due to inoculation of *cryptosporidium*. The present study has confirmed intestinal lesions. Bell *et.al.* (2003) have reported ulcerative enteritis in quails, chicks and young turkeys and reported outbreak of ulcerative enteritis in chicks may follow outbreak of coccidiosis. Primary lesions were seen in the lower third of the small intestine; ceaca lesions in the intestine vary from petachial hemorrhage to ulceration. Similar findings correlates this with present findings. Srilatha (2003) reported 33.7% mortality in quails in Tirupathi. The birds were dull, depressed and necropsy revealed hemorrhage of intestinal mucosa due to *pasturella species*. Tell *et.al.* (2003) has reported infection of *Mycobacterium* in Japanese quails causing morbidity and mortality. Infected quails showed lesions in intestine. Yilmaz *et.al.* (2004) found gross lesions in intestine due to experimentally inoculated avian influenza virus H7N1 subtype. Zahar Ahmed Radi (2004) reported gross and histological lesions of enteritis in quails. Intestines has marked ulcers, hemorrhages, ulcerative enteritis was evident. Presence of *Eimeria* species was evident. The present study has also experienced similar findings.

In the present study, a total of 176 (35.12%) intestinal samples, were found affected with enteritis and 128 (25.54%) with coccidiosis, out of 501 total observations.

ACKNOWLEDGEMENT

The present work was carried out under the research scheme "Pathology of digestive system-liver, proventriculus, pancreas and intestine and hematology in quails". This project is funded by

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Morningness- Eveningness Circadian Rhythms in Shift Workers



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Abstract

The result of MEQ shows that the subjects could be assigned following types of chronological cycle: Definitely morning type (DMT), Moderately morning type (MMT), Intermediate or Neither type (NT) and Moderately evening type or more towards evening type (MET) and Definitely evening type (DET). There is a weak relation between age and chronotype of sampled people. With increasing age especially after age of forty years, morningness increases. There is a remarkable deviation from the well established Dogmatic Gaussian distribution of chronotype in present study. In the sample Morning type (73%) dominated over Neither type (26%) and Evening type (1%). Though BMI of evening type is higher than morning type in studied sample, it is difficult to say that it is only due to chronotype. Other factors may also contribute. Further study is needed for it.

Keywords: Morningness- eveningness, Chronotype, Age, BMI.

Introduction

Morningness and eveningness refers to chronotype in human beings. In chronobiology the cyclical phenomenon in living organism and their adaptation to solar and lunar rhythms are examined. Human beings are diurnal creature, active in day time and sleeping at night. However many of us especially shift workers are required to adjust our self to different patterns of activity and sleep as part of our daily life. Such disturbance in circadian cycle may have influence on behavior.

Objective of the study

Main purpose of the study is to know about a person's (shift workers) peak alertness is in morning, in the evening or in between and whether age has any effect on chronotype of people or does shift work modulate the in general Indian pattern of early chronotype?

Methodology

Random sampling was done. Sample included 200 male employees working in all the three shifts in Bhilai Steel plant, Bhilai for five or more years. They were asked to fill a Self Assessment Questionnaire (MEQ, Horne and Ostberg, 1974) to determine morningness and eveningness. The timings of different shift were as follows:

Shift	Timings
A Shift (Morning Shift)	6:00 am to 2:00 pm
B Shift (Noon or Day Shift)	2:00 pm to 10:00 pm
C Shift (Night Shift)	10:00 pm to 6:00 am

MMT), Intermediate or Neither type (NT) and Moderately evening type or more towards evening type (MET) and Definitely evening type

Pattern of shift rotation for workers was from C to B, from B to A and from A to C shift.

Besides, body weight, age and height of workers were also recorded.

Observation, Result and Discussion

Age of sample individuals was between 30 years to 59 years. Maximum samples were between 40 to 59 years of age. This shows most of them are working as shift worker since several years.

The result of MEQ shows that the subjects could be assigned following types of chronological cycle: Definitely morning type (DMT), Moderately morning type ((DET).

Combined application of Azotobacter and Urea to improve growth of rice (*Oryza sativum*)

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Abstract: *Azotobacter* is a free living nitrogen fixer and a plant growth promoting rhizobacteria. It is gram negative, motile, spherical bacteria. It promotes the plant growth by producing auxin, producing siderophores and solubilizing phosphate. In present study combine application of a biofertilizer and a chemical fertilizer is done. *Azotobacter* alone and with the combination of 100%, 75%, 50% and 25% urea is applied to rice seeds and effect on the seed germination and plant growth have been recorded. It is observed that coinoculation of chemical and biofertilizers improves the growth of plant.

Key Words: Auxin, *Azotobacter*, fertilizer, rice, urea

I. Introduction

In modern agriculture practices to fulfill the soil with high nutrient content and to prevent the crop by the effect of pesticides there is an increase in the excessive use of chemical fertilizers and chemical pesticides. Due to this not only the fertility of soil get decreased but it also affect the growth of soil beneficial microorganism whose presence promote the growth of plants by many mechanisms. Bacteria are most abundantly occurring microorganism in rhizosphere. The group of bacteria which colonize plant root and promote the growth of plant is called as plant growth promoting rhizobacteria. *Azotobacter* is one of the plant growth promoting rhizobacteria which is proved to promote the growth of plant producing growth hormones. *Azotobacter* belonging to family Azotobacteraceae, is gram negative free living nitrogen fixer. It comprises of six species. (Tchan *et al*, 1984) Various crops in India have been inoculated with *azotobacter* and its application improves the yield of both annual and perennial crops. (Biswas *et al*). *Azotobacter* affects seed germination and seedling growth in plants and increase yield of crop plant upto 30% (Klopper *et al* 1992, Shaikat *et al* 2006, Gholami *et al* 2009). It has been shown by many researchers that *Azotobacter* possess plant growth promoting properties such as plant growth hormone production, phosphate solubilization etc. It also shows antimicrobial activity. Joseph and co workers reported the IAA producing *Azotobacter* species from chick pea (Joseph *et al* 2007). *A. vinelandii* have ability to produce siderophores, solubilise phosphate and make it available for plants thus promote plant growth (Husen 2003). Urea is a chemical fertilizer most widely used for better growth of plants. In Chhattisgarh it is used in rice crop field to increase the availability of nitrogen. Although the use of urea increase the production of crop but it also causes harmful effect on the plant growth promoting rhizobacteria. In present study species of *Azotobacter* is isolated from rice field and different doses of a chemical pesticide urea is applied to *Azotobacter*, in vitro, to study the effect of chemical fertilizer on its growth.

II. Material and methods

2.1. Isolation of *Azotobacter* from Rice rhizosphere:-

Azotobacter is isolated from rhizospheric soil of rice plant by using the serial dilution plate techniques in Ashby's medium (Aneja). Rice plant were uprooted with some quantity of non rhizospheric soil and place in sterilized bags and immediately brought to laboratory. The non rhizospheric soil was carefully removed and the rhizospheric soil is collected under aseptic condition. This rhizospheric soil is mixed with the distilled water through gentle shaking and the serial dilution technique is performed. An aliquot of the suspension is spread in the petriplate containing ashby's media. The plates were then allowed to incubate at 28°C for 3 days. Fast growing *Azotobacter* colonies were streaked in another petriplate containing ashby's media and pure culture is maintained by subculturing the isolates.



RESEARCH ARTICLE

Effect of Industrial Effluents on Ecophysiological Properties of Plants of Bhilai Industrial Area, India

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²Government Danveer Tularam College, Utai, Chhattisgarh, India

Study Area: Raipur & Durg, Chhattisgarh India

Coordinates: 20°54' to 21°32'N; 81°10' to 81°36'E & 22°33' to 21°14'N; 82°06' to 81°38'E

Key words: Floral diversity, Regional flora, Soil texture

Abstract

The pollutants of industries often alter the existing biodiversity of that particular area. Contamination of soil occurred due to the release of hydrocarbons, pesticides and other metals in the soil reduce plant metabolism and crop yield. The present work was undertaken to evaluate the effect of industrial effluent on growth pattern and ecophysiological properties of the plants existing around Bhilai industrial area. During the fieldwork, soil samples were collected from the study areas for analysis of different soil parameters. Frequency, relative frequency, density, relative density, abundance, plant cover, basal area and relative dominance of each species were calculated by a standard quadrat method. Regional floras were used for the identification of plants. The dominant plant species were carefully recorded in all the four zones of study area. The study of species diversity would be helpful in understanding community composition, structure, change, and development as species diversity is regulated by the environmental factors.

Introduction:

Pollution study in industrial units has been aimed by many researchers. Usually, Industries discharge their wastes into water and on land without any treatment or after partial treatment (Jolly *et al.*, 2012). Indeed, the untreated or partially treated effluent enters in a water body either gets dissolved or lies in a suspended form on the main water bodies, thereby causing the aquatic pollution. Indian cities are being exposed to high levels of air pollution and people living in these cities are paying a price for the deterioration in air quality. Agricultural crops can be effected when exposed to high concentrations of various air pollutants (Gupta, 2016). Damages range from visible markings on the foliage, reduced growth and yield to the premature death of the plant (Bolan & Hedley, 2003). The pollutants can also cause a serious threat to the overall physiology of plants. Any disturbance in the soil ecosystem can disturb the microbial activity and thereby affecting the availability of nutrients and thus affecting the vegetation type of that particular area. The soybean crop was also observed to have the adverse effects of textile dye (Ravi *et al.*, 2014). Thus, the present study was taken into consideration to study the soil of industrial area and its ecophysiological effect on the plants of Bhilai industrial area.

Since ancient times, state Chhattisgarh of India is famous for its natural resources, tribes and rich biodiversity. The state is endowed with 44% of forest cover. A large size of the human population resides in forest and villages. Plants play important role in their life particularly in dialects, socio-religious ceremonies, a traditional and domestic system of medicine.

Methodology:

Study area: district Durg and Raipur both are adjacent to each other. Durg is somewhat situated in the southern part of the rich Chhattisgarh plain with forests covers of 2,238 km². It has heavy to deep soils, which have high water retention capacity due to high clay content. These soils have better nutrient value and are suitable for paddy cultivation. However, Raipur district is situated in the fertile plains of Chhattisgarh Region. The climate of both the districts is a tropical type, mainly dry and hot.

For current study the area was divided into four zones;

- Bhilai Industrial Area, Zone I
- Bhilai Steel Plant, Zone II
- Chunkatta Bhilai Area, Zone III
- Botanical Garden, NPG College of Science, Raipur (control)


Each of the four zones was further divided into 10 study sites. The study area was divided on the basis of diversity, distribution, structure of communities and soil conditions.

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Comparative study of application of vitex, a medicinal plant

 **Authors:** Niharika Dewangan, Ranjana Shrivastava and A.K. Shrivastava
Date: Dec. 2015

 **From:** Indian Journal of Life Sciences (Vol. 5, Issue 1)
Publisher: Global Academic Society

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Length: 1,069 words
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Abstract :

Vitex commonly known as nirgundi belongs to family Verbenaceae, is an important medicinal plant. The parts of vitex are used as a traditional medicine by tribal people of Chhattisgarh in various part of the state. Leaves of plant possess alkaloids, reducing sugar, glycosides, sterol, resins, and tannins. It is found curative in asthma, lung disease, urinary trouble, tonsillitis, rheumatism etc. The dry leaves protect grains from insects and it is also found that smoke of leaves repels mosquitoes. Thus vitex being an important medicinal plant needs better fertilizer application for better cultivation and production. The plant can be easily propagated through stem cutting and roots so should also be planted in house. There is also a need to create awareness among the common people about the nirgundi plant and its various uses. The present study is focused on the application of biofertilizer in Vitex plant. **KEYWORDS:** Vitex, medicinal plant, nirgundi, biofertilizer

Related Subjects

- Medicinal plants
- Plant growth
- Vitex

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Co-inoculation of *Azotobacter* and *Pseudomonas* to improve growth of rice (*Oryza sativa*).

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Author Email : dewangannilanjika081@gmail.com
Journal article : Indian Journal of Tropical Biodiversity 2015 Vol.23 No.1 pp.98-101 ref.22

Abstract : Several plant growths promoting rhizobacteria are used as biofertilizers. *Azotobacter* and *Pseudomonas* are the free living nitrogen fixer and a plant growth promoting rhizobacteria. They promote the plant growth by producing phytohormon auxin and siderophores. Both found to solubilize insoluble phosphate. In present study *Azotobacter* and *Pseudomonas* alone and in both combination is applied to rice seeds for better growth and effect on the seed germination and plant growth have been recorded. It is observed that co-inoculation of rhizobacteria improves the growth of plant than inoculated alone and also over control. Height of plant is recorded in combine inoculation, in *Azotobacter* and in *Pseudomonas* after 20 days of seed sown. The aim of present study was to promote use of biofertilizer and reduce excessive use of chemical fertilizer.

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Diversity of Actinomycetes in Parboiled Rice Mill Effluent

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Abstract: A Study Was Conducted To Find The Diversity Of Actinomycetes Present In Parboiled Rice Mill Effluent Situated In Bailad District Of Chhattisgarh State, India. Samples Were Collected From Two Sites, One Being Effluent Outlet Drain And The Other The Paddy Soaking Tank. Several Isolates Of Actinomycetes Have Been Recovered From Parboiled Rice Mill Drain Effluent. No Actinomycetes Could Be Recovered From Paddy Soaking Tank. *Streptomyces* Was The Most Prominent Genus Recovered. Rest Of Them Belonged To The Genera *Micromonospora*, *Nocardia*, *Kinshipia* And *Thermoplasma*. Actinomycetes Show Diverse Colony Characteristics Which Changes With Different Cultural Conditions. While Morphological Characters Remain Same.

Keywords : Actinomycetes, Diversity, Effluent, Parboiled Rice Mill

I. Introduction

Due To Huge Cultivation And Multiple Varieties Of Rice Grown In Chhattisgarh, It Is Commonly Called As 'Bowl Of Rice'. And Rice Is One Of Staple Crop Here, For Which Parboiled Rice Is Produced In Parboiled Rice Mills. It Is A Popular Product Throughout The Country. It Is Consumed In A Stable Quantity All Through The Year. Husk And Part Of The Bran From Paddy Are Removed To Produce Edible Rice By Rice Mill Processing. Parboiling Is A Pre-Milling Process For Paddy Which Is Known To Originate In India [1]. A Large Amount Of Water For Soaking Of The Paddy Is Required For The Process Of Parboiling. Two Simple Steps Are Performed - Firstly Soaking In Hot Water At 60-70° C For 3 - 7 C-Hrs [2]. And Then Secondly Water Is Drained Out. If Not Properly Treated, This Water Results In Water Pollution. It Also Causes Odour Nuisance To Nearby Residents. Water Pollution Is Caused By High Levels Of Organic Material Present In Effluent [3]. High Values Of BOD, COD And Organic Contents Are Recorded In This Effluent. Organic Contents Are Mainly In The Form Of Starch And Pieces Of Husk. Thus, It Has The Potential To Deteriorate And Damage The Environment [4]. It Is A Rich Source Of Carbohydrates And Vitamins And Ferms A Good Source Of Food For Microbes And To Flourish [4]. As Actinomycetes Are Widely spread In Water Bodies, They Play An Important Role In The Natural Mineral Cycles Owing To Their Ability Of Growing At Low Concentrations Of Carbonaceous Substances As Well As To Degrade Recalcitrant Organic Substances [5]. They Are Well Known Also For The Production Of Primary And Secondary Metabolites Which Are Of Immense Economic Importance. Though Fungi Were Discovered As First Antibiotic Producers (Penicillin), Actinomycetes Are Now Known As A Major Group Of Microbes That Produce More Number Of Antibiotics. As Antibiotics Exhibit Life Saving Properties, They Are Of immense Help To Mankind. After The Antibiotics Were Discovered As Medicines, A Revolution Has Occurred In Farming And Industries. Sometimes They Are Correctly Known As The "Medical Marvels". A Wide Range Of Important Enzymes Are Produced By Actinomycetes, Some Of Which Are Produced On An Industrial Scale. They Play A Major Role In The Pharmaceutical Industry. Some Enzymes, E.G. Lipase, Amylase And Cellulase From Actinomycetes Are Important In Textile, Fermentation, Food, And Paper Industries [6]. They Have The Ability To Degrade A Wide Range Of Hydrocarbons, Pesticides, And Aliphatic And Aromatic Compounds. They Perform Microbial Transformations Of Organic Compounds. A Field Of Great Commercial Value. Many Genera Of Actinomycetes Have The Potential For Use In The Bioconversion Of Wastes Into High-Value Chemical Products. Few Members Of This Group Of Microbes Have Been Found To Degrade Pesticides With Widely Different Chemical Structures. According To Some Scientists, The Fresh Water Habitats May Be Sources Of Actinomycetes That May Produce Useful Metabolic Products [7]. The Actinomycetes Participate In The Turnover Of The Soil Components And Transformation Of Organic Compounds [8,9]. The Major Function Of Actinomycetes Is Decomposition And Mineralization Cycles With The Production Of Extracellular Enzymes, Such As Cellulases, Amylases

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SECONDARY METABOLITES AND ETHNOMEDICINAL IMPORTANCE OF FEW LEAFY VEGETABLES USED BY TRIBAL PEOPLE OF CHHATTISGARH

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Traditional systems of medicine are being used since Vedic period. Chhattisgarh is known for its ethnic and ethnomedicinal diversity of medicinal plants and several ethnic groups with good knowledge of herbal healer. Medicinal plant resources of forest origin are extensively used by tribals of Chhattisgarh. Tribals inherited their own traditional knowledge based system for treatment of various diseases. The ayurvedic system of medicines is the part of cultural life and heritage of tribal people. Plants produce varieties of compounds of known therapeutic properties. These substances are used for developing new drugs. Phytochemicals are phytonutrients naturally occurring in plants. They protect the plant from UV rays, disease, natural enemies such as pathogens and herbivores. They are a part of plant immune system. The fruits, vegetables and herbs contain natural substance. Terpenoids, alkaloids, gums, resins, lectins, glycosides, saponin, steroids, phenolics, tannins, carotinoides, flavonoides, sulphur, phytic acid, brassinosteroids, compounds, fiber etc. are important phytochemicals found in plants. In Chhattisgarh, the life and economy of the tribal and local people are intimately connected with the natural vegetation. Leafy vegetables play a major role in the nutritional requirement of the tribal and local population in remote parts of the Chhattisgarh. Leafy vegetable not only provide food but also make significant contribution to the nutritional intake of the population throughout the year.

INTRODUCTION

Green leafy vegetables are good source of nutrition. Abujh Maria, Muria, Bison-Horn Maria, Dhurwa, Dorla, Bhatra, Halba various tribal groups live in Chhattisgarh whose life and culture is nourished by natural vegetation. Many wild varieties are also used as food. They are a rich source of minerals, iron, calcium, potassium, magnesium, vitamin K, vitamin C, vitamin B complex etc. Began (2001). These provide phytonutrients like β -carotene, lutein and zeaxanthin, etc. Due to rich source of vitamins and minerals leafy vegetables keep the human body free from diseases such as intestinal disorder, cardiac

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Uses of weeds as Medicine in Durg District of Chhattisgarh

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Abstract

Survey done in 2012-2013 and 2013-2014 in Durg district of Chhattisgarh state showed the biodiversity of different weeds. About 21 families with 42 genera and 46 species were studied. Out of which, 43 weeds belonged to 20 families of Angiosperms having medicinal properties. Among them, 07 belonged to monocot where as 36 belonged to dicot group. They were reported to be used in treating various diseases. Chhattisgarh is rich in biodiversity, having wild as well as cultivated plant of the weeds are allergenic, poisonous and harmful to mankind, while the others have medicinal value.

Durg district of Herbal Chhattisgarh state of India is famous for its natural resources, tribes and rich Biodiversity since ancient time. Site selection Durg district is situated in the 21° 13' N and 81° 26' E. The state is endowed with 44% of forest cover. A large size of population resides in forest and villages. Plants play important role in their life particularly in dialects, socioreligious ceremonies, traditional and domestic system of medicine. The knowledge of medicinal weeds is being orally transmitted by the tribal's and others old family members, from one generation to another^{20,25}. Thus present work is taken into consideration to prepare a collection data for those weeds, which are used as medicine in the district.

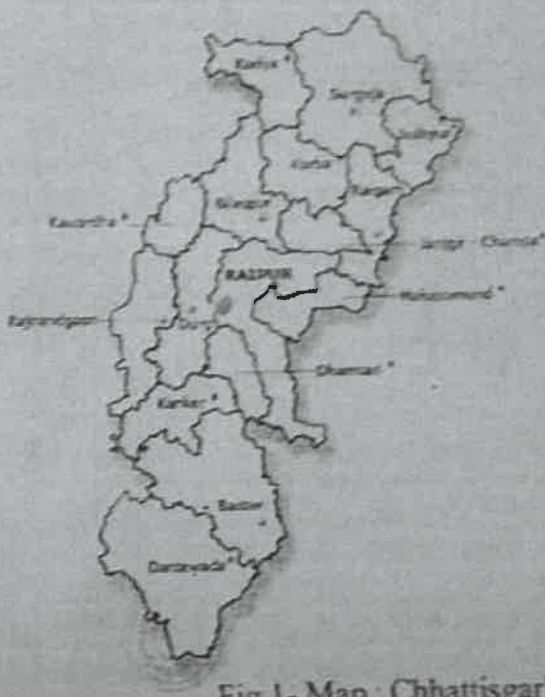


Fig 1- Map : Chhattisgarh

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Combined application of Azotobacter and Urea to improve growth of rice (*Oryza sativum*)

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Abstract: *Azotobacter* is a free living nitrogen fixer and a plant growth promoting rhizobacteria. It is gram negative, motile, spherical bacteria. It promotes the plant growth by producing auxin, producing siderophores and solubilizing phosphate. In present study combine application of a biofertilizer and a chemical fertilizer is done. *Azotobacter* alone and with the combination of 100%, 75%, 50% and 25% urea is applied to rice seeds and effect on the seed germination and plant growth have been recorded. It is observed that combination of chemical and biofertilizers improves the growth of plant.

Key Words: Auxin, *Azotobacter*, fertilizer, rice, urea

I. Introduction

In modern agriculture practices to fulfill the soil with high nutrient content and to prevent the crop by the effect of pesticides there is an increase in the excessive use of chemical fertilizers and chemical pesticides. Due to this not only the fertility of soil get decreased but it also affect the growth of soil beneficial microorganism whose presence promote the growth of plants by many mechanisms. Bacteria are most abundantly occurring microorganism in rhizosphere. The group of bacteria which colonize plant root and promote the growth of plant is called as plant growth promoting rhizobacteria. *Azotobacter* is one of the plant growth promoting rhizobacteria which is proved to promote the growth of plant producing growth hormones. *Azotobacter* belonging to family *Azotobacteriaceae*, is gram negative free living nitrogen fixer. It comprises of six species. (Tehan *et al.* 1984) Various crops in India have been inoculated with *azotobacter* and its application improves the yield of both annual and perennial crop. (Biswas *et al.*) *Azotobacter* affects seed germination and seedling growth in plants and increase yield of crop plant upto 30% (Klopper *et al.* 1992, Shaikh *et al.* 2006, Ghosh *et al.* 2009). It has been shown by many researchers that *Azotobacter* possess plant growth promoting properties such as plant growth hormone production, phosphate solubilization etc. It also shows antimicrobial activity. Joseph and co workers reported the IAA producing *Azotobacter* species from chick pea (Joseph *et al.* 2007). *A. vinelandii* have ability to produce siderophores, solubilize phosphate and make it available for plants thus promote plant growth (Husen 2003). Urea is a chemical fertilizer most widely used for better growth of plants. In Chhattisgarh it is used in rice crop field to increase the availability of nitrogen. Although the use of urea increase the production of crop but it also causes harmful effect on the plant growth promoting rhizobacteria. In present study species of *Azotobacter* is isolated from rice field and different doses of a chemical pesticide urea is applied to *Azotobacter*, in vitro, to study the effect of chemical fertilizer on its growth.

II. Material and methods

2.1. Isolation of *Azotobacter* from Rice rhizosphere:-

Azotobacter is isolated from rhizospheric soil of rice plant by using the serial dilution plate techniques in Ashby's medium (Aneja). Rice plant were uprooted with some quantity of non rhizospheric soil and place in sterilized bags and immediately brought to laboratory. The non rhizospheric soil was carefully removed and the rhizospheric soil is collected under aseptic condition. This rhizospheric soil is mixed with the distilled water through gentle shaking and the serial dilution technique is performed. An aliquot of the suspension is spread in the petriplate containing ashby's media. The plates were then allowed to incubate at 28°C for 3 days. Fast growing *Azotobacter* colonies were streaked in another petriplate containing ashby's media and pure culture is maintained by subculturing the isolates.

COMPARATIVE PHYTOCHEMICAL ANALYSIS OF THE AQUEOUS LEAF EXTRACT OF SOME IMPORTANT LEAFY VEGETABLES FROM DURG (CHHATTISGARH)

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ABSTRACT : Leafy vegetables play an essential role in human diets, as they support the normal functioning of the different body systems. They provide our cells with vitamins, minerals, fiber, essential oils and phytochemicals. The non-nutritive chemical compounds produced by plants, called phytochemicals, have protective or disease preventive properties against competitors, predators, or pathogens. It is well-known that plants produce these chemicals to protect themselves and recent research demonstrate that they can also protect humans against diseases. There are more than thousand known phytochemicals found in plants. Some of these have been used as traditional medicines. The present paper aims at the comparative phytochemical analysis of the leaf extract in aqueous solvent of commonly grown five types of leafy vegetables that are of common occurrence in the town, Durg, viz., *Cordia dichotoma* G. Forst., *Senna tora* (L.) Roxb., *Ipomoea aquatica* Forssk., *Labiab purpureus* (L.) Sweet and *Corchorus olitorius* L.

Key words : Phytochemical screening, Leafy vegetables, Aqueous solvent, Nutrients

INTRODUCTION

The leaves of the plant constitute a good source of many nutrients which are the essential elements for our body. They contain fibrous matter, cellulose and moisture which provide roughage in the diet and stimulate intestinal activities. Leafy vegetables are nutritional powerhouses filled with vitamins, minerals and phytonutrients. They are rich in chlorophyll, which alkalizes the blood, and fiber, which keeps our body healthy. Nearly one thousand species of plants with edible leaves are known. The green vegetables are a rich source of minerals, iron, calcium, potassium, magnesium, vitamin K, vitamin C, vitamin B complex etc. (Began, 2001). Due to rich source of vitamins and minerals leafy vegetables provide immunity and keep the human body free from diseases such as intestinal disorder, cardiac problems, cancer, diabetes etc. People who eat fruits and vegetables in their daily life have a lower risk of heart disease and some neurological disease (Stanner, 2004). Their medicinal values are believed to be dictated by their phytochemicals and other chemical constituents (Fallah *et al.*, 2005). Leafy vegetables contain bioactive compounds which protect the body from nutritional deficiency diseases (Momoh-Aliu, 2007). They are also known as plant derived chemicals, which are beneficial to human health and disease prevention (Onyeka and Nwambekwe, 2007). Leafy vegetables contain secondary metabolites which provide protection against the disease and act as, cardiovascular agent, antiobesity agent, antidiabetics, anticancer agent, immune boosters, chronic inflammatory disorders and degenerative disease (Sharma and Rawal, 2013). These vegetable are extensively cultivated in India and consumed by human being. They contain important food constituents that can be used for body building, as sources of energy, regulatory and protective materials as well as for the maintenance of overall good health and prevention of diseases (Otiotoju *et al.*, 2014).

Five important leafy-vegetables from Durg :

***Cordia dichotoma* G. Forst :** *C. dichotoma* belongs to genus *Cordia* and family *Boraginaceae*. It is a plant commonly cultivated for ornamental purposes. It is widely spread in tropical and subtropical region. It is found in a variety of forests ranging from the dry deciduous forests of Rajasthan to the moist deciduous forests of Western Ghats and tidal forests in Myanmar. Leaf of plant traditionally shows the therapeutic uses and actions such as anthelmintic, astringent, diuretic, demulcent, purgative, expectorant, tonic, ulcer and cough. The juice of the leaves is considered cooling, and is applied as a poultice to treat migraine, inflammation and swellings (Khond *et al.*, 2009; Patel *et al.*, 2011 and Hussain and Kakoti, 2013).

***Senna tora* (L.) Roxb :** *S. tora* belongs to sub-family *Caesalpinoideae*, family *Leguminosae/Fabaceae*, is a small shrub which grows up in warm moist soil throughout the tropical parts of Asian and African countries. It is known by different names in different places like wise Foetid Sickle Senna, Wild Senna, Sickle Pod, Coffee Pod, Tovar, Chakvad, Ring-worm Plant (Ingle *et al.*, 2012). It is also known as 'Chakramard' in Ayurveda, 'Panwar' in Unani and 'Jue Ming Zi' in Chinese system of medicine. Also the most commonly known name, 'Sickle pod', is due to Sickle shape of pods (Jain, 1968 and Pawar & D'Mello, 2004). In ancient system of medicine, *Senna tora* or *Cassia tora* was used to treat a variety of medical complications like bronchitis, constipation, conjunctivitis, ulcer, hypertension, hypercholesterolemia, liver damage, fungal infection, diabetes ringworm, skin diseases (Choudhary *et al.*, 2011). According to Ayurveda, the leaves and seeds are acrid, anthelmintic, antiperiodic, cardiostimulant, laxative and liver tonic (Jain and Patil, 2010).

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SECONDARY METABOLITES AND ANTIOXIDANTS SCREENING OF LABLAB PURPUREUS (L.) SWEET IN DIFFERENT SOLVENTS

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In this study leaves of *Lablab purpureus* (L.) sweet were used and subjected to cold maceration extraction. Acetone, ethyl acetate, 70% ethanol and water were used as solvents for extraction. The extracts were screened for secondary metabolites such as alkaloid, flavonoid, phenols, glycosides, saponin, terpenoids, tannins, phytosterols and steroids. Total phenolic content (TPC) and Total flavonoid content (TFC) were investigated for extracts. The antioxidant activities of extracts were evaluated by using DPPH and FRAP in-vitro assay methods. The 70% ethanolic extract (S5C) exhibited highest phenolic content (541.44 ± 10.18 mM gallic acid equivalent/g of extract) and aqueous extract (S5D) exhibited highest flavonoid content (611.00 ± 5.09 mM quercetin equivalent/g of extract). S5D extract showed the highest antioxidant activity. DPPH (2,2-diphenyl-1-picrylhydrazyl) assay, were showed 19.57 ± 1.10 and 70.64 ± 1.80 percent of radical scavenging activity with $50 \mu\text{g/ml}$ and $500 \mu\text{g/ml}$ of S5D extract respectively. FRAP assay showed $6.12 \mu\text{M Fe}^{2+}/\text{mg}$ of reducing capacity with $500 \mu\text{g/ml}$ of S5D extract. These results suggested that *L. purpureus* can be used in dietary applications with a potential to reduce oxidative stress.

INTRODUCTION

Lablab purpureus is a species of bean which belongs to the Fabaceae family. The wild forms of *Lablab* are originated in India (Murphy and Colucci, 1999) and Africa (Cook *et al.*, 2005). *Lablab* has been widely spread to many tropical and subtropical countries where it has become naturalized (Purseglove 1968). In South and Central America, East and West Indies, Asia, China and India, *Lablab* is grown as an annual or a short-lived perennial (Whyte *et al* 1953). It grows from sea level up to 6,500 ft. (Fao, 2012). *Lablab purpureus* is a woody climbing herb which can reach a length of 5 metres. Leaves are pinnate and generally 3-foliolate. Leaflets are acute, entire, 6–12 cm by 5–9 cm. Flowers are white or purplish pink. Fruits are green pods, 6 cm long by 2 cm wide, flattened, contain 4–5 seeds and turn light brown when mature.

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