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# SHRI YASHWANTRAO PATIL SCIENCE COLLEGE, SOLANKUR

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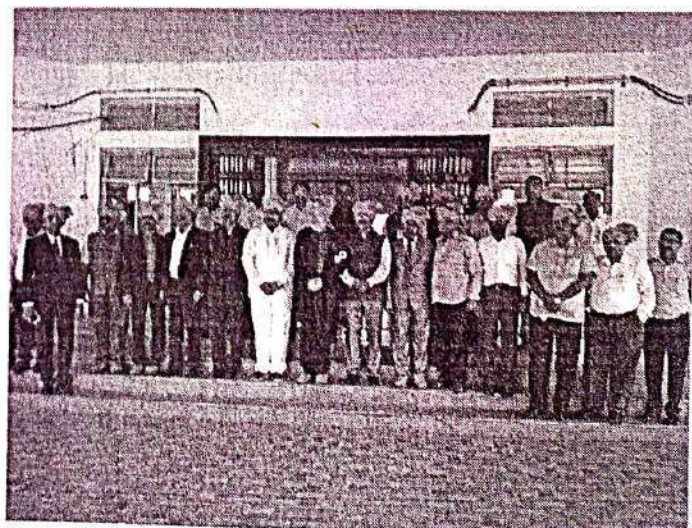
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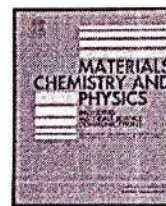
## Activity Report – Conference / Seminar

(Academic Year: 2018-19)

Name of the activity	-	Conference – 2 <sup>nd</sup> ICMES-2018
Organized by	-	Department of Physics, YPSC Solankur
Date of Activity	-	7 <sup>th</sup> & 8 <sup>th</sup> December 2018
Time	-	9 am onwards
Venue	-	Shivaji University Kolhapur auditorium
Total Number of participants	-	more than 100
Name of Faculty	-	Dr RB Patil, Dr SH Tamboli, Dr AA Jatratar
Objective	-	conference
Outcome	-	recent advances in nanomaterials and technology, worked as Editor of special issue published in in Scopus indexed journal,







# Development of magnetically recyclable nanocatalyst for enhanced Fenton and photo-Fenton degradation of MB and Cr(VI) photo-reduction

Rupali Chavan<sup>a, b, 1</sup>, Nilesh Bhat<sup>a, 1</sup>, Santosh Parit<sup>b</sup>, Kitchamsetti Narasimharao<sup>c</sup>, Rupesh S. Devan<sup>c</sup>, Rahul B. Patil<sup>d</sup>, Vijay C. Karade<sup>e</sup>, Nilesh V. Pawar<sup>f</sup>, Jin Hyeok Kim<sup>e</sup>, Jyoti P. Jadhav<sup>a, \*\*</sup>, Ashok D. Chougale<sup>b, \*</sup>

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## ARTICLE INFO

### Keywords:

Fenton  
Photo-Fenton  
Cr(VI) reduction  
Dye degradation  
Magnetic nanoparticles

## ABSTRACT

The present work reports the facile green synthesis of  $\text{Fe}_3\text{O}_4$  magnetic nanoparticles (MNPs) and their Fenton and photo-Fenton catalytic activity for reduction reactions. The glucose-mediated MNPs exhibit spherical morphology with an average diameter of  $6.3 \pm 1.1$  nm. The catalytic activity of MNPs evaluated for Fenton and the photo-Fenton reactions resulted in 92 and 93% dye degradation in just 120 and 75 min, respectively. The magnificence of this novel synthesis methodology is the higher efficiency of both processes at varied pH ranges. Different catalytic parameters like wide pH range, catalyst dose, and  $\text{H}_2\text{O}_2$  concentrations have made it more effective for both processes. Besides, the reusability study showed 63.71 and 57.57% activity even after six cycles in Fenton and photo-Fenton processes, respectively. The scavenger study showed the involvement of  $\bullet\text{OH}_{\text{ads}}$  over  $\bullet\text{OH}_{\text{free}}$  in the Fenton process, where  $\bullet\text{OH}$  was found as a prime source of dye degradation in the photo-Fenton process. Moreover,  $\text{Fe}_3\text{O}_4$  MNPs successfully reduced the 80 ppm load of Cr(VI) within 25 min, which improved further to 15 min by adding a chelating agent. This Fenton and photo-Fenton magnetically reusable catalyst will indulge the development of water treatment in an eco-friendly and economical way with great potential.

## 1. Introduction

The catastrophe of environmental pollution affects human health and has become a global concern. The leading source of pollution is the chemical products by industry or everyday products such as pesticides, coatings, printing inks, adhesives, cleaning agents, and personal care [1], which have become the greatest threat of pollution. Also growing industrial sector of textile, paper, and printing increases the threat of pollutants by its dyes and toxic heavy metals containing effluent. Worldwide over  $7 \times 10^5$  tons of synthetic dyes are produced annually, whereas  $2 \times 10^5$  tons of these dyes are lost to effluents annually during industrial operations [2]. Improper treatment of effluents that contain dyes causes water contamination, which is destructive to the environment. In recent years, nitrophenols and pigments used in pesticides,

drugs, paper, plastic, paint, cosmetics, food, textiles, printing, and synthetic dyes, causing a considerable hazard towards environmental pollution [3]. These chemicals directly discharged in an open environment affect water, soil, plants, and animals.

Methylene blue (MB) is a heterocyclic aromatic compound known as methyl thioninium chloride, commonly used as a cationic dye. It also harms aquatic life by preventing its growth and regeneration [4]. Hence, it is necessary to remove the dyes from wastewater. Various technologies are developed to degrade or decolorize dyes, including physical, chemical, and biological approaches [5–9]. Some processes include filtration, reverse osmosis, electrochemical oxidation, activated carbon adsorption, coagulation, ion exchange, flocculation, ozonation, advanced oxidation, and the Fenton process for the decontamination of textile waste [10]. The advanced oxidation process (AOP) is one of the

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## On the shape based SPR of silver nanostructures

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**Abstract:** Nanoscience and nanotechnology is the key towards enrichment of human life. It has been functional in almost all the sectors viz. energy, safety, medicine, biomedical, security, communication, space, health, agriculture, etc. The class of nanomaterials from 0D (dimensional) to 3D includes nanotubes, nanorods, nanoparticles (NPs), nanowires, nanoplates, nanodots (quantum dots), etc. Among the noble metals, silver nanomaterials have been of great interest since ancient times. It is being used in different fields such as textile industry, food packaging, cosmetic industry, catalysis, various bio applications, coatings, DNA sequencing, SERS, etc. The last decade has concentrated on its antibacterial potential and its use in nano-bio-applications. The interesting optical properties specifically surface plasmon resonance (SPR) have been studied widely to explore its practical application in sensors, bio-devices, data storage, spectroscopic techniques, catalysis etc. It can be tuned by varying size and shape of NPs. Along with this SPR is the prime easy tool to get the prima-facie information about size and shape of the synthesised nanomaterials. This paper aims to focus on shape based SPR of silver nanostructures.

**Keywords:** silver; AgNPs; nanostructure; nanotechnology; SPR; surface plasmon resonance.

**Reference** to this paper should be made as follows: Patil, R.B. and Chougale, A.D. (2021) 'On the shape based SPR of silver nanostructures', *Int. J. Nanotechnol.*, Vol. 18, Nos. 11/12, pp.1015–1027.

**Biographical notes:** Rahul B. Patil is working as Head of the Department of Physics, YP Science College, Solankur. He is IQAC coordinator. He received his PhD in Physics from Shivaji University, Kolhapur in 2008. His research area is thin film and currently working in field of nanomaterials. He has 22 research papers in Scopus indexed journals. He has been Postdoctoral Fellow at National Central University, Taiwan.





# Analytical methods for the identification and characterization of silver nanoparticles: A brief review

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Silver nanoparticles

XRD

XPS

DLS

TEM

FTIR

## ABSTRACT

Bionanotechnology is one of centered subdisciplines inside nanotechnology. Since antiquated occasions, silver nanoparticles (AgNPs) are being utilized for an assortment of uses. Numerous combination techniques are developed under the top-down and bottom-up methodology. The precise particle characterization is essential after synthesis since the properties of a particle could significantly affect its physico-chemical and biological properties. The trademark highlight of nanomaterials, for example, size, shape, size dispersion, surface zone, shape, solvency, aggregation etc. should be assessed before surveying poisonousness or biocompatibility. The evaluation of the synthesized nanomaterials are done using many analytical techniques such as XRD, UV-vis spectroscopy, DLS, FTIR, XPS, SEM, AFM, TEM and so on. Here, key techniques are described along with a few examples in accordance with recent studies on AgNPs.

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Selection and peer-review under responsibility of the scientific committee of the 3rd International e-Conference on Frontiers in Mechanical Engineering and nanoTechnology.

## 1. Introduction

The noble metals especially silver nanoparticles (AgNPs) are being used since ancient times for various applications. Inferable from their interesting properties, for example, high surface-to-volume proportion, broad size shape, and compositional tunability, agreeability to recuperation, they are generally utilized in the biomedical field and catalysis. The huge advancements in the field of nanoscience have driven and boosted the field of nanotechnology. Looking at the recent pandemic situation due to COVID-19, the various research organizations with the help of governments and industries invented vaccines that arrived in a historically short period. Nano-based materials have played a crucial role in diagnosis and treatment. The viability of nanomaterials relies upon different boundaries dependent on the specific application. The different combination strategies have developed under top-down and bottom-up methodologies. Every technique has its disadvantages and preferences. Tuning the property of nanomaterials concerning shape and size has likely used in nanotechnology. The nanomaterials exist in different structures, for example, nanocubes, nano-

wires, nanoparticles (NPs), nanoplates, nanoprisms, nanorods, nanotubes, and so on. The usefulness of nanomaterials with a particular size and shape becomes important for the particular application. In this context, analytical techniques play a crucial role. The fundamentals of the analytical techniques along with insights into AgNPs are discussed with recent examples.

## 2. Analytical techniques for characterization of AgNPs:

### 2.1. X-ray diffraction

X-ray diffraction (XRD) is a non-destructive technique and one of the essential scientific strategies which have been utilized to investigate the molecular and crystal structures along with qualitative identification of various compounds, quantitative resolution of chemical species, estimating the level of crystallinity, isomorphous substitutions, particle sizes etc. Analysis of the materials to a great extent relies upon the arrangement of a diffraction pattern. The working principle of XRD is Bragg's law and is based on the wide-angle elastic scattering of X-rays. When the crystal is exposed to X-rays, it forms several diffraction patterns. These patterns replicate the physico-chemical characteristics of the materials crystal structures. In a powder specimen, diffracted beams

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## Original Research Article

**ETHNO BOTANICAL USES OF *LEEA MACROPHYLLA* ROXB. AND  
*LAGERSTROMIA PARVIFLORA* ROXB.**Manisha S Sutare<sup>1\*</sup>, Rajesh S Gaikwad<sup>2</sup>

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Dist. Kolhapur, Maharashtra, India
2. Department of Botany, Swami Vivekanand Senior College Mantha,  
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**ABSTRACT:** *Leea macrophylla* Roxb. and *Lagerstromia parviflora* Roxb. are important traditionally used medicinal plants from ancient time period. In present work, medicinal significance and the pharmacological effects of the plant are discussed. It is essential to study the uses of plants and other associated knowledge which will help for researchers to introduce new phytoproducts for scientific validation. Besides, the present work suggests that the more scientific data is required to explore its chemical constituents in the treatment of diseases and disorders for making new therapeutic drugs. It is also suggested that both species are under threat of extinction so need to be protected.

**Keywords:** *Leea*, *Lagerstromia*, phytoproducts, medicinal plants, traditional medicine.

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**1. INTRODUCTION**

Western ghat within Maharashtra is a known to have good repository for plants that have preventive and curative effects on human health, thereby have been used as traditional medicine (TM) for different ailments since ancient times. TM is popular in parts of the African and Asian countries. According to World Health Organization (WHO), more than 80% of the world populations depend on TM for their primary health care needs. Plant-based medicinal systems continue to play an



# CONSERVATION OF WILD TAXA: PRESENT SCENARIO



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YESHWANTRAO PATIL SCIENCE  
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416 212 ( M. S. )**



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SVSPM, Solankur)



**Hon. Shri. R. Y. Patil**  
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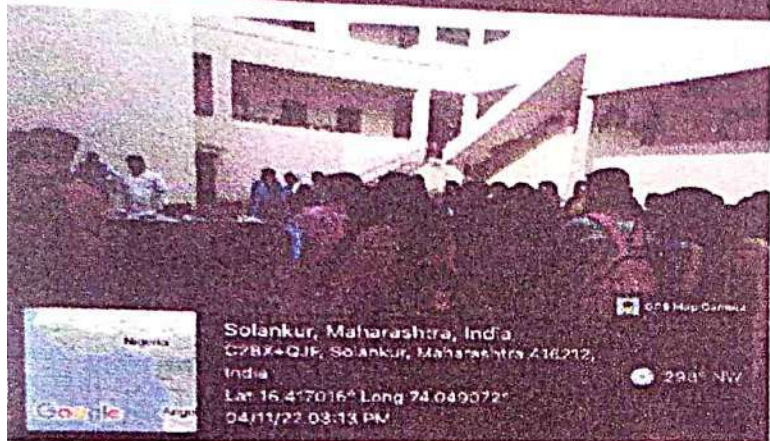
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Date: 01/03/2023

# Telescope Making Workshop

(Hands on Training Program)

## Activity Report

Department of Physics, Shri Yashwantrao Patil Science College Solankur in collaboration with The New College, Kolhapur had organized and successfully conducted Telescope Making Workshop under MoU Activity on 01/03/2023 at conference hall of New College, Kolhapur. The workshop was specially designed for school children to enrich their knowledge about instrumental and observational astronomy.

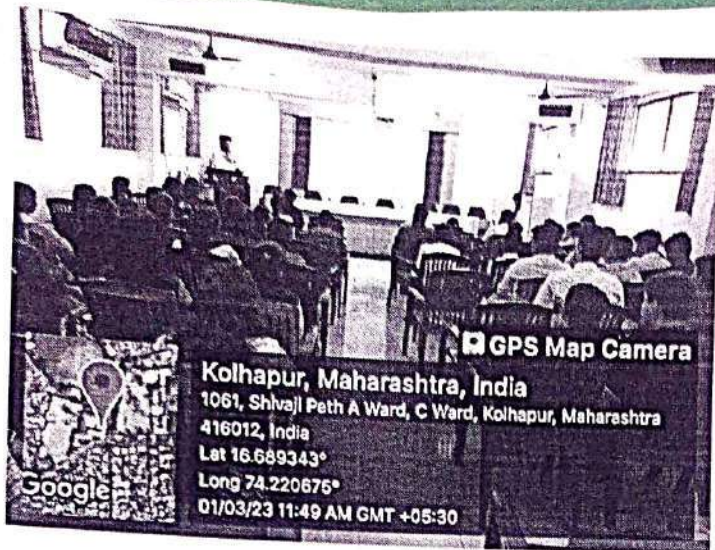
The students were introduced the theoretical background of telescopes, their types, their mounts, steps involving in the process of telescope making through PPT presentation and trained them to built telescope by their own. 13 students were participated from kolhapur and sangali district. After assembling, participants were also trained to find and focus the celestial objects.

Dr. A. A. Jatralkar has worked as trainer for the workshop and guided students. As, it was the MoU activity, Teaching staff of Physics department of both colleges were actively involved in the workshop.

Dr. R. B. Patil, Dr. S. H. Tamboli, Dr. P.D. Kamble, Dr. A. A. Kalgonda, Mrs. S. S. Pawar, Mr. S. K. Sutar, Principal Dr. G. G. Chougale, Principal Dr. V. M. Patil have supported and provided all the necessary facilities.











कोल्हापूर : न्यू कॉलेजमध्ये खगोलीय दुर्बीण निर्मिती कार्यशाळेत उपस्थित विद्यार्थी, पालक व शिक्षक.

# न्यू कॉलेजमध्ये खगोलीय दुर्बीण निर्मिती कार्यशाळा

कोल्हापूर, ता. ३ : सोळांकूर येथील श्री यशवंतराव पाटील विज्ञान महाविद्यालय आणि न्यू कॉलेज यांच्या भौतिकशास्त्र विभागांच्या संयुक्त विद्यमाने खगोलीय दुर्बीण निर्मिती कार्यशाळा झाली.

डॉ. अविराज जत्राटकर यांनी मार्गदर्शन केले. दुर्बीणी तयार करण्यासाठी आवश्यक असणारे साहित्य

निवडण्यापासून ते त्यापासून दुर्बीण तयार करण्यापर्यंत सर्व प्रशिक्षण विद्यार्थ्यांना देण्यात आले. प्राचार्य डॉ. जी. जी. चौगले, प्राचार्य डॉ. व्ही. एम. पाटील, डॉ. राहुल पाटील, डॉ. सिकंदर तांबोळी, डॉ. ए. ए. कलगोंडा, डॉ. प्रदीप कांबळे, एस. के. सुतार उपस्थित होते. प्रास्ताविक स्वप्नाली पवार यांनी केले. रेशमा डेडगकर यांनी आभार मानले.





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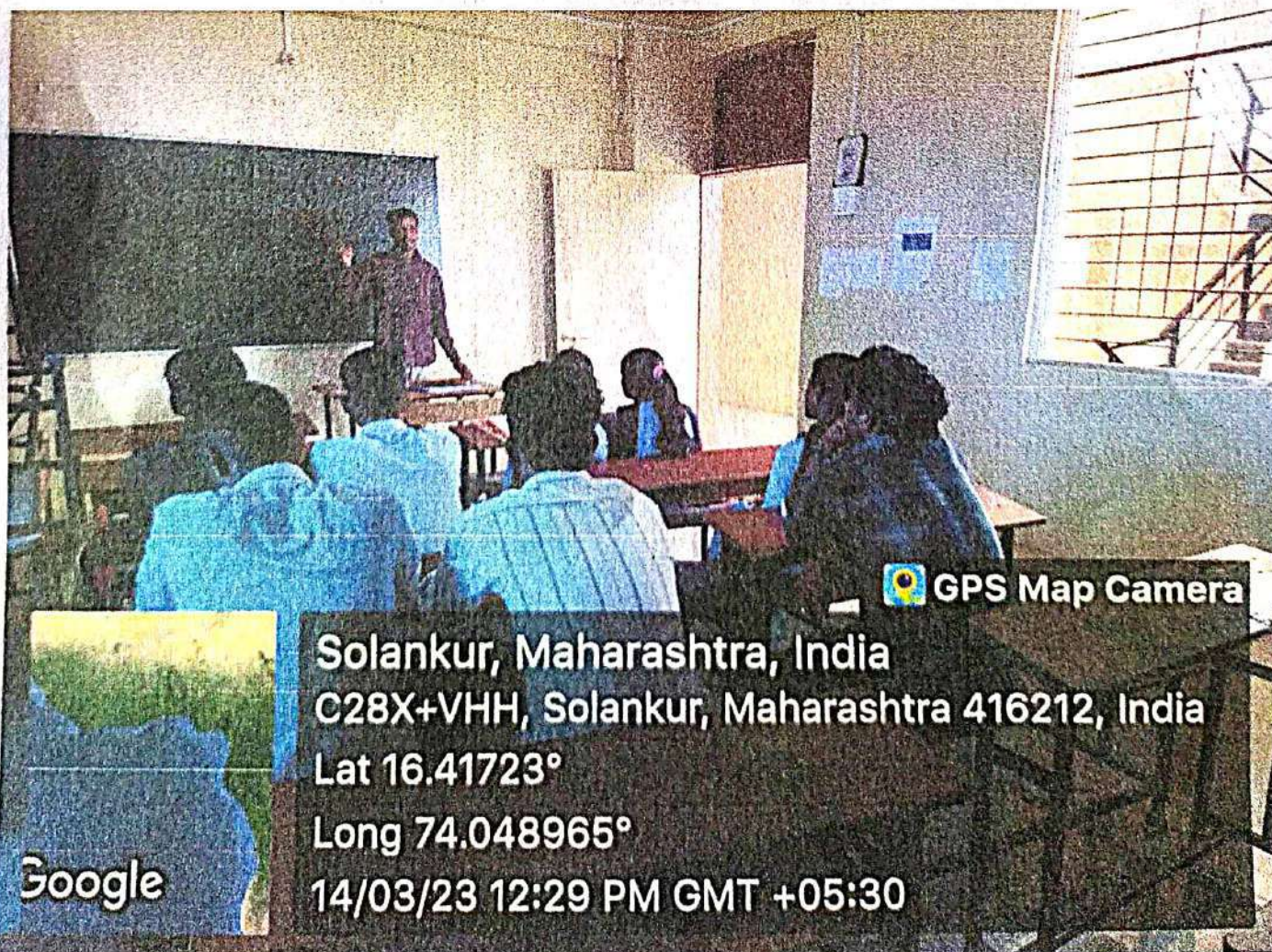
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President

**LINKAGE**

**YPSC, Solankur and BMK, Kurukali**

### Activity (Guest Lecture)

Mr. Amar K. Patil, Assistant Professor, BMK, Kurukali delivered a guest lecture on "Graph Theory" under Linkage in our college dated 14<sup>th</sup> March 2023.



GPS Map Camera

Solankur, Maharashtra, India

C28X+VHH, Solankur, Maharashtra 416212, India

Lat 16.41723°

Long 74.048965°

14/03/23 12:29 PM GMT +05:30

Google





Guest Lecture by Dr. U. H. Patil ( Career Opprtunities) and Dr. . R. G. Kamble (World Environment Day)



C28X+QJF, Solankur, Maharashtra 416212, India

Latitude  
16.4170101°

Local 01:04:27 PM  
GMT 07:34:27 AM

Note : Guest Visit

Longitude  
74.0490043°

Altitude 576 meters  
Saturday, 17.06.2023

Guest Lecture by Shri. R.S. Bhosale (Plant Diversity)







**!! Vidya Param Bhushanam!!**

Shri.Doodhsakhar Shikshan Prasarak Mandal's, Bidri.

## **Doodhsakhar Mahavidyalaya, Bidri**

(Mouninagar)-416 208. Tal:Kagal. Dist:Kolhapur (M.S.)

[NAAC REACCREDITED WITH B GRADE.]

Phone: (O) - 02325-254822, (R) - 02325-2595822 Mobile: 7588257822.

Website- [www.dmbidri.edu.in](http://www.dmbidri.edu.in), E-Mail: [dmbidri@gmail.com](mailto:dmbidri@gmail.com)

Affiliated to Shivaji University, Kolhapur-416004. (M.S) ) & Included Under UGC 2 (f) & 12 (B)

Principal: Dr. S. D. Patil., M.A. B. Ed., M. Phil, Ph.D.

DMB/ /2022-23

Date : 17/01/2023

### Letter of Thanks

To,  
Dr. Swapnil D. Khorate.  
Dept. of Statistics,  
Yashwantrao Patil college of Science,  
Solankur.

Dear Sir,

According to our invitation dated 14/01/2023 you have delivered a lecture on **"Research Projects for B. Sc. III Students"** for our B. Sc. III (STATISTICS) students. The students are highly benefited from your Knowledge and experience and were happy with your approach.

Thank you for sharing your knowledge and expertise with us.

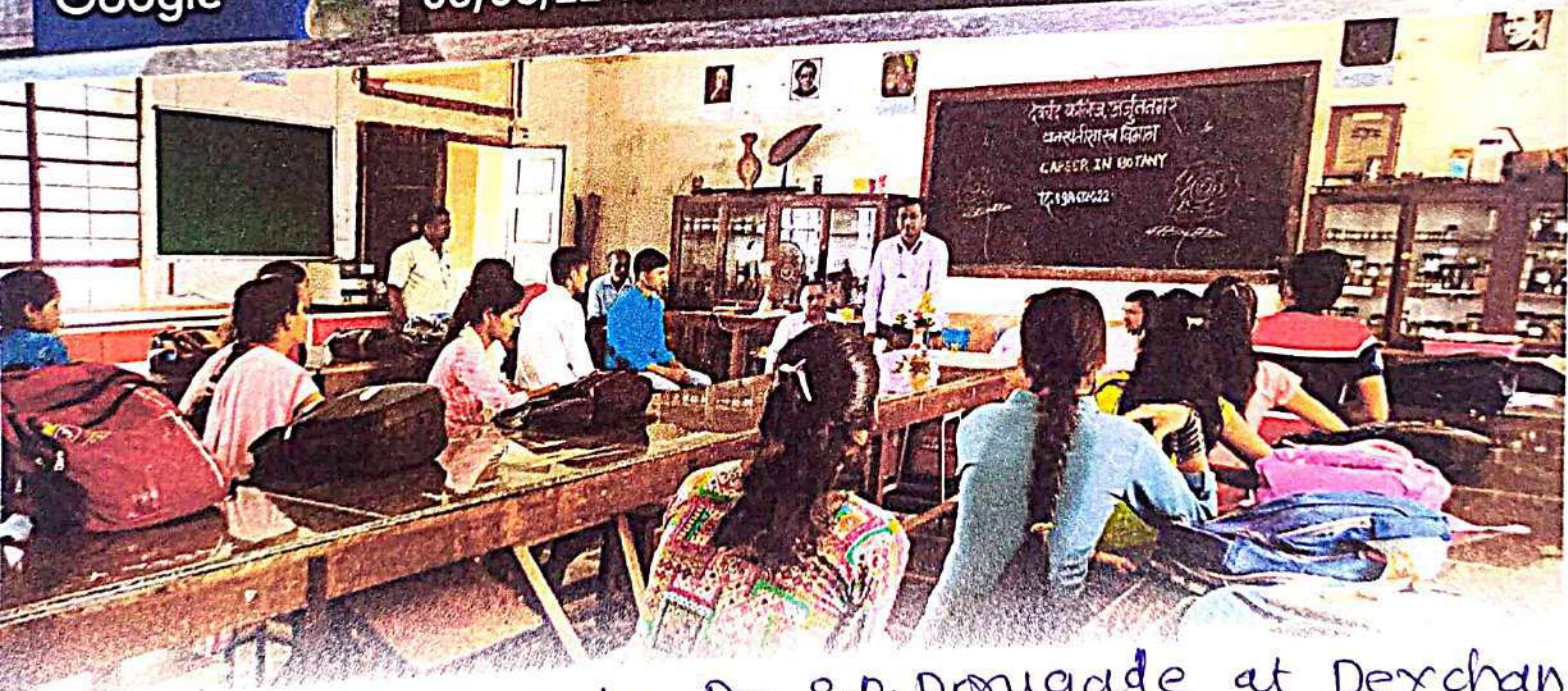
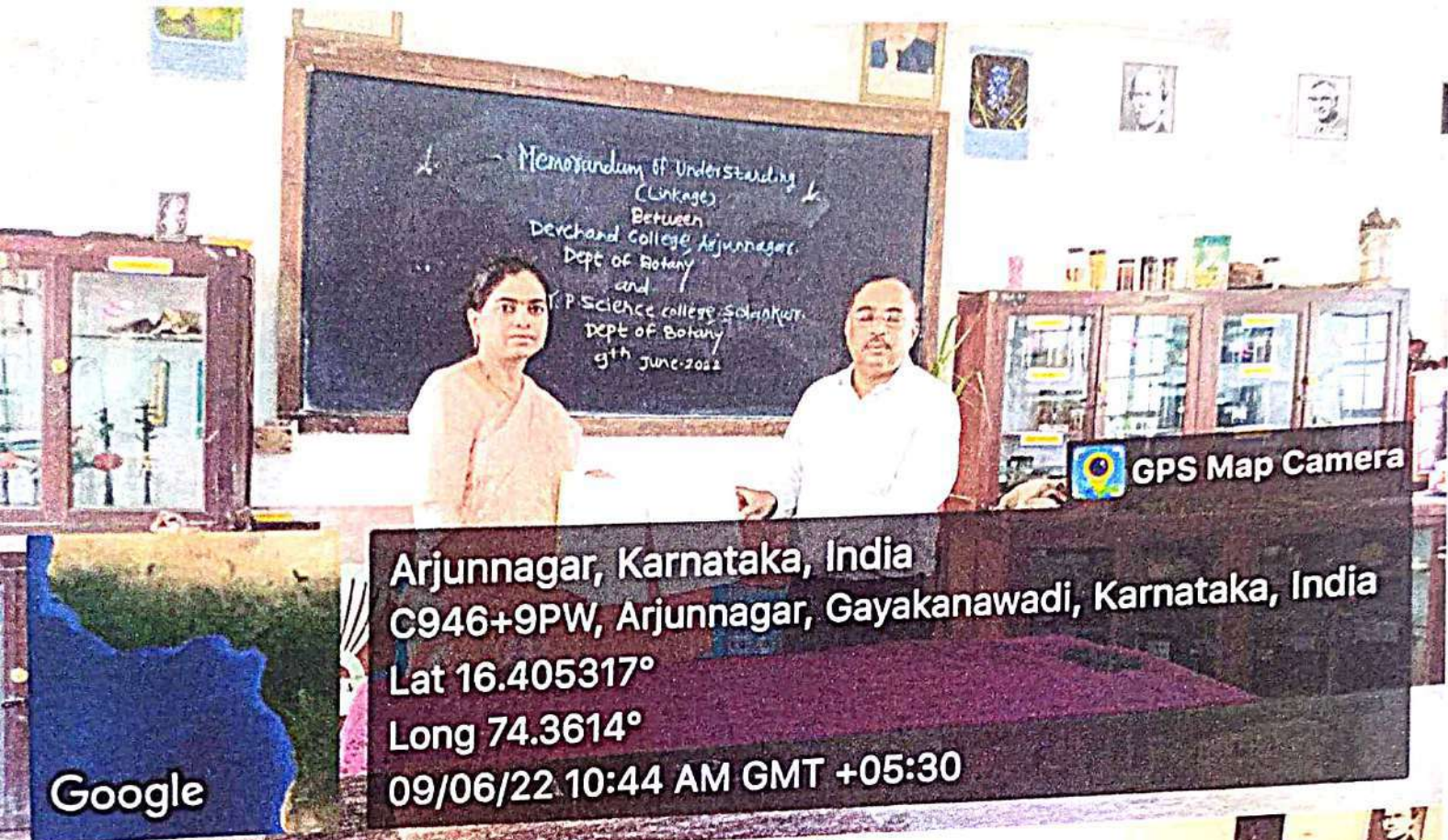


**PRINCIPAL**

DOODHSAKHAR MAHAVIDYALAYA,  
BIDRI, TAL. KAGAL, DIST. KOLHAPUR







Guest lecture by Dr. S.P. Dorugade at Dextrchand College, Arjunnagar.





स्थापना: १९९४



नॅक पुर्नमुल्यांकन :B++ (सीजीपीए-2.६)

"सर्वांग सुंदर जीवन यासाठी शिक्षण"

ज्ञानसाधना शिक्षण प्रसारक मंडळ, निवडे संचलित

म.ह.शिंदे महाविद्यालय, तिसंगी

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( शिवाजी विद्यापीठ, कोल्हापूर संलग्नीत )

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फोन ऑफिस : (०२३२६) २५४९४८

एम. कॉम . . एम. लिब अँड इन्फ . सायन्स . . एम. फिल . . पीएचडी

मोबाईल: ९४२९९९९९२५

जा. क्र. एमएचएसटी / २०२२-२३ / ५७

दिनांक: / /

13 MAY 2022

To,

Dr. S. V. Madhale,

Head Department of Botany,

Shri. Yashwantrao Patil Science Mahavidyalaya,

Solankur, Kolhapur.

**Subject:** Letter of Appreciation.

Dear Sir,

We are really grateful to you for giving a lecture on the topic "Lipid Metabolism" to our students, on 13<sup>th</sup> May 2022 organized by Department of Botany under faculty exchange program. Our students are enlightened by your guidance. This will be helpful to all students for their career development. We thank you for extending cooperation.

Thanking you,

Yours faithfully,

  
H.C. PRINCIPAL  
M. H. Shinde Mahavidyalaya, Tisangi  
Tal. Gaganhavda, Dist. Kolhapur



26/04/2023



Shri YPSO Solabkur  
Green Audit Environment Audit  
2023.04.26 15:18  
16.41967, 74.04867  
C28X+VHH, Solankur, Maharashtra 416212



Shri YPSO Solabkur  
Green Audit Environment Audit  
2023.04.26 16:11  
16.41967, 74.04867  
C28X+VHH, Solankur, Maharashtra 416212

**Green Audit, Energy Audit, Environment Audit Guidance Programme**







॥ GYAN SEVA TYAG ॥

Shri Vyanknath Shikshan Prasarak Mandal's

## SHRI YASHWANTRAO PATIL SCIENCE COLLEGE, SOLANKUR

Taluka: Radhanagari, District: Kolhapur (Maharashtra, India). Pincode: 416212

Email: [ypvmsolankur@gmail.com](mailto:ypvmsolankur@gmail.com) / [ypvms.436.cl@gmail.com](mailto:ypvms.436.cl@gmail.com)

Website: [www.ypsc.ac.in](http://www.ypsc.ac.in)

Affiliated to Shivaji University Kolhapur, MS, India | Accredited by NAAC with 'B' Grade (CGPA=2.14)

Shri. A. Y. Patil  
Secretary

Shri. R. Y. Patil  
Chairman



### Department of Zoology


#### Guest Lecture at Rajarshi Chha. Shahu College, Kolhapur

Under the Linkage signed between Shri Yashwantrao Patil Science College, Solankur and Rajarshi Chha. Shahu College Kolhapur, on **07/12/2022** Dr. Lagade V. M. has given the guest lecture on **Topic: 'Comparative Anatomy of Brain of Vertebrates'** to the B.Sc. students. He has given a splendid and very informative talk on Brain anatomy of Vertebrates. This lecture was very fruitful and very helpful in enrichment of knowledge to the students. Total 25 students were present for lecture. Faculties like Ms. D. V. Malvekar, Dr. V. A. Kamble, Dr. S. V. Lagade and Mr. S. S. Jagtap were presented for this event.



  
**Head**  
Department of Zoology  
Shri. Yashwantrao Patil Science  
College, Solankur.



  
**PRINCIPAL**  
Shri Yashwantrao Patil Science College,  
Solankur, Tal. Radhanagari, Dist. Kolhapur.





Government of Maharashtra

Estd :1380

Rajaram College, Kolhapur

Department of Zoology

Eco-Prithvi Club

Vidyanagar, Kolhapur 416004

E-Mail: [rckzoology@gmail.com](mailto:rckzoology@gmail.com)

No. RCK/Zoo/2023/

Date: 10 /03 /2023

To,

The Head

Department of Zoology


Shri. Yashwantrao Patil

Vidyan Mahavidyalaya, Solapur

Subject: Invitation for Bio-Genius Competition.

Respected Madam,

With reference to above subject, we are organizing State level Bio-Genius Competition organized by Eco-Prithvi club, Department of Zoology, Rajaram College Kolhapur, in collaboration with Department of Zoology, Government Vidarbha Institute of Science and Humanities (Autonomous), Amravati, on 14<sup>th</sup> March, 2023 at 12:00 pm. Kindly send at least 10 UG/PG students for participation in this Competition.

  
Head, Department of Zoology  
Rajaram College Kolhapur  
Head of the Zoology Department  
Rajaram College Kolhapur



## Activity Report: Faculty exchange programme under MoU (Academic Year: 2022-23)

Name of the activity	-	Guest lecture on "Pharmaceuticals"
Organized by	-	Doodhsakhar Mahavidyalaya, Bidri
Date of Activity	-	7 <sup>th</sup> February 2023
Time	-	11.00 am
Venue	-	Auditorium Hall, DMB, Bidrti
Total Number of participants	-	All T. Y. B. Sc. Students, Department of Chemistry, DM, Bidri
Name of Faculty	-	Mr. J. K. Chavan
Objective	-	Collaboration in teaching, research and development, and consultancy studies in the field of mutual intrest,

*Darsh*

**Head**

Department of Chemistry  
Shri. Yashwantrao Patil Science  
College, Solankur.



*810*


**PRINCIPAL**

Shri Yashwantrao Patil Science College,  
Solankur, Tal. Radhanagari, Dist. Kolhapur.




# Some Photos of Faculty Exchange Programme



  
Head  
Department of Chemistry  
Shri. Yashwantrao Patil Science  
College, Solankur.



  
PRINCIPAL  
Shri Yashwantrao Patil Science College,  
Solankur, Tal. Radhanagari, Dist. Kolhapur.



## Activity Report: Faculty exchange programme under MoU

(Academic Year: 2022-23)

Name of the activity	-	Guest lecture on "Chemical Kinetics"
Organized by	-	Doodhsakhar Mahavidyalaya, Bidri
Date of Activity	-	7 <sup>th</sup> February 2023
Time	-	01.00 pm
Venue	-	Auditorium Hall, DMB, Bidrti
Total Number of participants	-	All T. Y. B. Sc. Students, Department of Chemistry, DM, Bidri
Name of Faculty	-	Dr. A. D. Kamble
Objective	-	Collaboration in teaching, research and development, and consultancy studies in the field of mutual intrest,



**Head**

Department of Chemistry  
Shri. Yashwantrao Patil Science  
College, Solankur.





**PRINCIPAL**

Shri Yashwantrao Patil Science College,  
Solankur, Tal. Radhanagari, Dist. Kolhapur.



# Photos of Faculty Exchange Programme



*Danesh*

Head

Department of Chemistry  
Shri. Yashwantrao Patil Science  
College, Solankur.



*SIV*

PRINCIPAL

Shri Yashwantrao Patil Science College,  
Solankur, Tal. Radhanagari, Dist. Kolhapur.