



**Department : BOTANY**

**Academic Year : 2020-21**

Sr. No.	Programme Code	Name of the Programme
01.	311	M. Sc. Botany

Following students have carried out their Project work/  
Internship/ Field Project/Industrial Training for the academic  
session 2020-21

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# MEDICINAL PLANTS USED TO TREAT DIABETES

A Dissertation Report

SUBMITTED

FOR THE PARTIAL FULFILMENT OF THE DEGREE OF  
MASTER OF SCIENCE IN BOTANY

BY



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This is to certify that dissertation entitled **MEDICINAL PLANTS USED TO TREAT DIABETES** is based on the original review done by **AARTI BARAIK** student of Msc (Botany) under the guidance of **DR.MAMTA PATRA SHAHI** From the Department Of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur and the report has not been submitted to any other University for the award of any degree or diploma.

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DECLARATION

I declare that the review presented in this project dissertation entitled "MEDICINAL PLANTS USED TO TREAT DIABETES" submitted for the partial fulfilment of Msc Botany as carried out by meat Department Of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur(CG).

The work in this project dissertation is original and will remain intellectual property of department of Botany, Guru Ghasidas Vishwavidyalaya Bilaspur (CG).The information given in this dissertation report including data, are original credited. If any discrepancy, mistake or plagiarism found in this report, the responsibility for the same will be solely mine.

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## **ACKNOWLEDGEMENT**

It is my pleasure to express my sincere gratitude to my supervisor Dr. Mamta Patra Shahi Assistant Professor Department Of Botany, GGV Bilaspur (CG), under whose guidance the present project review has been completed. Their valuable suggestion helped me a lot.

I extend my thanks to all my dear classmates who always helped in completion of this review.

Last but not the least thanks to my family for their moral support and also those who directly or Indirectly contributed to successful completion of this review.

**(Arti Barik)**



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# **WEEDS PLANTS IN PHYTOREMEDIATION OF HEAVY METALS FROM INDUSTRIAL WASTE**

**A DISSERTATION**



**SUBMITTED FOR THE PARTIAL FULFILMENT OF THE DEGREE OF  
MASTER OF SCIENCE IN BOTANY (Hons.)**

**BY**

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## DECLARATION

I, AMRITA GOP, hereby declare that the work presented in this project dissertation entitled "WEEDS PLANTS IN PHTOREMEDIATION OF HEAVY METALS FROM INDUSTRIAL WASTE" submitted for partial fulfillment of Master of Science in Botany (Hons.) was carried out at Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G), India

The work was carried out by me under supervision of Dr. Vineet Kumar, Assistant professor, Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)

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## ACKNOWLEDEMENT

First and foremost, I express my deepest gratitude to my supervisor, Dr. Vineet Kumar, Assistant professor, in the Department of Botany at Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G), India, whose inspiration, supervision and support and encouragement to complete my dissertation work **“WEEDS PLANTS IN PHYTOREMEDIATION OF HEAVY METALS FROM INDUSTRIAL WASTE”** from preliminary to concluding level on this project. I also thank for his kindness, timely cooperation and Guidance for this project.

I would like to thank Dr. S.K. Shahi, Head of department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G) for providing all the necessary facilities during the course of study.

Special thanks to my all teachers in the department, namely Dr. A.K. Dixit, Dr. S. K. Pandey, Dr. N. Tripathi, Dr. S. Shweta, Dr. S. Prajapati and all faculties of the department for their guidance and encouragement during the study.

I am also thankful to my all classmates for sharing their literature and valuable assistance. Finally, yet importantly, I take this opportunity to express my gratitude and love towards my parents and beloved family members, for their understanding, support and encouragement to give in this dissertation.

Date: July 26, 2021

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# A REVIEW ON ROLE OF MEDICINAL PLANTS IN ENVIRONMENTAL WASTE MANAGEMENT

A Dissertation

SUBMITTED FOR THE PARTIAL FULFILMENT

OF THE DEGREE OF  
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This is to certify that the dissertation report entitled "A REVIEW ON ROLE OF MEDICINAL PLANTS IN ENVIRONMENTAL WASTE MANAGEMENT" submitted by ANAMIKA KANNOUJE is based on the review work carried out under the supervision of Dr. Vineet Kumar, Assistant Professor, Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh. This is an original report and has not been previously submitted in part or full for the award of any other degree or diploma to this or any other university.

  
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## DECLARATION

I, ANAMIKA KANNOUJE, hereby declare that the work which is being presented in the thesis entitled "A REVIEW ON ROLE OF MEDICINAL PLANTS IN ENVIRONMENTAL WASTE MANAGEMENT" in partial fulfillment of the requirements for the award of the Degree of Bachelor of Science in Botany (Hons.) and submitted in the Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh is an authentic record of my own work carried out under the supervision of DR. VINEET KUMAR, Assistant Professor, Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh. The matter presented in this thesis has not been submitted by me for the award of any other degree in any other University/Deemed University without proper citation.

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## ACKNOWLEDEMENT

I am sincerely thankful to GGV Bilaspur (C.G.) for providing with the opportunity to write a review paper in the form of a dissertation on the topic ‘A REVIEW ON ROLE OF MEDICINAL PLANTS IN ENVIRONMENTAL WASTE MANAGEMENT’.

I am also thankful to my advisor Dr. Vineet Kumar, Assistant Professor, Department of Botany at Guru Ghasidas Vishwavidyalaya, Bilaspur, for imparting his knowledge and expertise in this study guiding me in every stage of this paper without his support for me to prepare the paper so meaningful and interesting.

I would like to thanks Dr S. K. Shahi, Head, Department of Botany at Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G), for providing all the necessary facilities during the course of study.

Special thanks to my all teachers in the department, namely Dr. A.K. Dixit, Dr. S.K. Pandey, Dr. V.N. Tripathi, Dr. S. Prajapati, Dr. S. Shweta, Dr. Deepankar Yadav, and all faculties of the department for their guidance and encouragement during the study.

I am also thankful to my all classmates.

Finally, yet importantly, I take this opportunity to express my gratitude and love towards my parents and beloved family members, for their understanding, support and encouragement to give in this dissertation

**(Anamika Kannouje)**



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## MONOGRAPH ON *Bombax ceiba*

Submitted in the Partial Fulfillment of the Requirements for the Award of the  
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I have declared that the work presented in the project dissertation entitled MONOGRPH ON Bombax ceiba.

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This work carried out by me under the supervision of Dr. A.K Dixit, associate professor of botany, Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G). the work presented in this project dissertation is original and will remain intellectual property of Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G).

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## ACKNOWLEDGEMENT

I would first like to thank Dr. A. K Dixit, Associate Professor Department of Botany, GuruGhasidas, Vishwavidyalaya for his support, guidance, encouragement, and advice that he has always graciously provided me during writing of the monograph on *Bombax Ceiba*. I am also absolutely indebted to Dr. S. K. Shahi Head of the Botany Department, Guru Ghasidas, Vishwavidyalaya for his dedication towards maintaining academic excellence and his readiness to provide academic helps to students during this difficult time of COVID 19.

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(Anwasha Dalpati)

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# **“Ethno Medicinal Plants Used for Treatment of Common Health Problems in Belgahna Village of Chhattisgarh”**

A

Dissertation Report

Submitted in Partial Fulfillment of the Requirement for the Award  
of the Degree of

MASTER OF SCIENCE  
IN  
BOTANY

TO



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## CERTIFICATE

This is to certify that the dissertation entitled “Ethno medicinal Plants used for treatment of common health problems in Belgahna village of Chhattisgarh” is based on the original work done by ARADHANA TIWARI (Enrollment No.GGV/16/3100) Department of Botany Guru Ghasidas Vishwavidyalaya, Bilaspur and this has not previously formed the basis of the award of any degree, diploma, associatedship and any other similar title and it represent entirely an independent work of the candidate.

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## DECLARATION

I hereby declare that work presented in this project dissertation entitled **“Ethno medicinal Plants used for treatment of common health problems in Belgahna village of Chhattisgarh”**, submitted for partial fulfillment of M.Sc. Botany was carried out by me under the supervision of **Dr. Ashwini Kumar Dixit (Associate Professor)** Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur(C.G.)

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## ACKNOWLEDGEMENT

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With deep sense, I express my sincere gratitude and indebtedness to my supervisor **Dr. A. K. Dixit**, Associate Professor of Botany under whose guidance I had the privilege to do my dissertation work. I am grateful to him for providing me the necessary facilities, meticulous guidance, constructive criticisms, encouragement and valuable suggestions during my thesis work. From the core of my heart, I beseech the entire array of words of thanks and reverence to mark gratitude towards Dr. S.K. Shahi Head of Department of Botany. I also owe a depth of appreciation and gratitude to my respected teachers, Dr. S.K. Pandey, Dr. V.N. Tripathi, Dr. S.K. Prajapati, Dr. Devendra Kumar Patel, Dr. S. Shweta, Dr. R.K. Ahirwar, Dr. Deepanker Yadav for encouragement during the study.

I am extremely thankful to my family, my friends for useful advice, moral support and timely help during the course of work. Words often fail to express my humble gratitude and profound regard to my family members for their affectionate encouragement and blessing which always being a source of inspiration for me without which it could not have been possible to achieve my targets. Lastly, I convey my regards to all those who directly or indirectly contributed to the successful completion of this project work.

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**ETHNOMEDICINAL PLANTS USED BY TRIBAL PEOPLE OF PUSSORE  
BLOCK, RAIGARH, CHATTISGARH, INDIA (A REVIEW)**

**A DISSERTATION REPORT**

**SUBMITTED**

**FOR THE FULFILMENT OF THE DEGREE**

**OF**

**MASTER OF SCIENCE**

**IN**

**BOTANY**




**BY  
BALVANT PATEL  
ROLL NO. - 19403308**

**UNDER THE SUPERVISION OF  
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### DECLARATION

I hereby declare that the work presented in this dissertation report entitled "Ethnomedicinal plants used by tribal people of Pussore block, Raigarh, Chattisgarh, India (A Review)" submitted for the partial fulfilment of M. Sc. Botany was carried out at Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C. G). The work was carried out by me under the guidance of **Dr. Ramesh Kumar Ahirwar, Assistant Professor, Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G).**

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## ACKNOWLEDGEMENT

The satisfaction of the successful completion of any task will be incomplete without the mention of people who has constantly guided, cooperated and encouraged me with all efforts. I am grateful to my project supervisor Dr. R.K. Ahirwar for the guidance, inspiration and constructive suggestions that helped me in preparation of this project.

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I also thank my parents for their moral and financial support in funding the project to ensure successful completion of the project.

**Balvant Patel**



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# **A review on the Effect of Cobalt on plant**

## **A Dissertation report**

**SUBMITTED ON THE PARTIAL FULFILMENT OF THE DEGREE OF MASTER  
OF SCIENCE IN BOTANY**



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I declare that the work presented in this thesis "A Reviem on the effect of cobalt in plant " submitted in partial fulfilment of MSc. Botany has beencarried out at the Department of Botany, Guru Ghasidas Vishwavidyalaya,Bilaspur(C.G).

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I would like to thank Dr. S.K. Shahi, Head of department of Botany, GuruGHASIDAS VISHWAVI-DALAYA(C.G) for providing all the necessary facilities during the course of study.

Special thanks to my all teachers in the department, namely Dr. A.K. Dixit, Dr. S.K. Pandey, V.N. Tripathi, Dr. S. Shweta, Dr. S. Prajapati and all faculties of the department for their guidance and encouragement during the study.

I am also thankful to my all classmates for sharing their literature and valuable assistance.

Finally, yet importantly, I take this opportunity to express my gratitude and love towards my parents and beloved family members, for their understanding, support and encouragement to give in this dissertation.

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## Content

### 1. Introduction

- Physical and chemical properties of Cobalt.....
- Biochemistry of Cobalt.....
- Cobalt in plants and the environment .....

### 2. Effect of Cobalt on plant

- Physiological effect .....
- Beneficial effect .....
- Toxicity of Cobalt in plant ....
- Toxic effect of Cobalt on plant .....
- Toxic effect of Cobalt on seed germination .....
- Toxic effect of Cobalt on pollen germination .....
- Toxic effect of Cobalt on photosynthesis .....
- Treating cobalt toxicity .....
- Effect of Cobalt in enzyme in plant ....
- Effect of Cobalt on nodulation .....
- Effect of Cobalt on nutrient .....

### 3. Cobalt uptake translocation and accumulation in plant

### 4. Effect of Cobalt on plant growth

### 5. Cobalt deficiency

### 6. Treating cobalt deficiency

### 7. Interaction of Cobalt with other metal

- Calcium .....
- Iron ....
- Other microorganisms....

### 8. Reference

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**Molecular modeling and structure based drug discovery**  
**against main protease of SARS COV-2**



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I am extremely thankful and express my sincere gratitude to my supervisor **Dr. S.K. Pandey** Assistant Professor, Department of Botany, G.G.V. Bilaspur Chhattisgarh India, whose encouragement, supervision and support from the preliminary to the concluding level enabled me to develop an understanding subject.

I express my greatest gratitude to **Dr. S.K. Shahi** Head of Department of Botany, GGV, for granting permission and providing me with an environment to complete my project successfully within the department.

I would also like to thank all my teachers including **Dr. A.K. Dixit, Dr. Devendra Kumar Patel, Dr. S.K. Prajapati, Dr. V.N. Tripathi, Dr. S. Shweta, Dr. R.K. Ahirwar, Dr. Deepanker Yadav** for their encouragement and suggestions that helped me to complete my dissertation successfully. I thank **Mr. N. Chandrakar and Mr. S. Nirmalkar**, our lab technician, who have been very kind to arrange and kept track of all the supplies.

I am also thankful to all my classmates who helped and supported me entire study.

I fail to collect words to acknowledge **Miss Mohineeta Pandey** (Research scholar) for helping me in my dissertation work and have always played a supportive role in providing me an opportunity to gather information at academic level.

Finally, yet importantly, I take this opportunity to express my gratitude to all Research Scholars, my parents and beloved family members for their support and encouragement to do my work more efficiently during the crucial times.

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# Monography on *Ipomoea aquatica* Forsk. used in rural area of Chhattisgarh

A Dissertation Report

Submitted

FOR THE PARTIAL FULFILLMENT OF THE DEGREE  
OF  
MASTER OF SCIENCE  
IN



By

Deeksha Goswami

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Under the supervision of  
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## CERTIFICATE OF GUIDE

This is to certify that Miss. Deeksha Goswami has carried out the Dissertation on the topic “Monography on *Ipomoea aquatica* Forsk. used in rural area of Chhattisgarh” in the Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G) under my supervision. She has worked methodically and collected the review sincerely and carefully. To the best of our knowledge the work presented in this dissertation in original and has not been submitted anywhere.

Dr. A.K DIXIT

(SUPERVISOR)

ASSOCIATE PROFESSOR

I forwarded the dissertation report to the respective examiners.

Dr. S.K SHAHI

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## DECLARATION

I declare that the work presented in this project dissertation entitled "Monography on *Ipomoea aquatica* Forsk. used in rural area of Chhattisgarh" submitted for the partial fulfillment of M.sc Botany was carried out at Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur(C.G).

I work in this project dissertation is original and will remain intellectual property of department of Botany, Guru Ghasidas Vishwavidyalaya Bilaspur (C.G). If any discrepancy, mistake or plagiarism found in the report, the responsibility for the same will be solely mine.

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## ACKNOWLEDGEMENT

I would like to concede respected supervisor Dr. A.K Dixit for his guidance and selfless efforts. Their valuable suggestion helped me lot. Under whose guidance the present dissertation work has been completed.

I am also grateful to Head of the Department Dr. S.K SHAHI for his dedication towards the pursue of knowledge and readiness to instill the same in his students has always been encouraging.

Special thanks to the teachers in the Department namely Dr. V.N Tripathi, Dr. S.K Pandey, Dr. S.K Prajapati, Dr. Vinita Dixit, Dr. R.k Ahirwar for encouragement during study.

I extend my thanks to my respected parents, my classmates and my seniors who always help in completion of project work.

Deeksha Goswami

M.Sc 4<sup>th</sup> Sem.



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4	Ethnomedicinal & Traditional uses
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**ETHNOMEDICINAL PLANTS USED BY THE TRIBAL PEOPLE IN  
DISTRICT BILASPUR, CHHATTISGARH (A REVIEW)**  
A Dissertation Report

**Submitted**

**For the fulfilment of the degree  
of  
MASTER OF SCIENCE  
IN**



**By**

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### CERTIFICATE

This is to certify that dissertation entitled "Ethnomedicinal plants used by the tribal people in District Bilaspur, Chhattisgarh (A Review)" is based on original work done by Diksha Gupta (Enrollment no. GGV/16/3117) Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur under the guidance of Dr. R.K. Ahirwar from the Dept. of Botany, GGV, Bilaspur and the report has not been submitted to any other University for the award of any Degree or Diploma.

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## DECLARATION

I hereby declare that the work presented in this dissertation report entitled "Ethnomedicinal plants used by the tribal people in District Bilaspur, Chhattisgarh (A Review)" submitted for the partial fulfilment of M. Sc. Botany Was carried out at Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C. G).

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I also want to acknowledge our lab technician and librarian Mr. Naresh Chandrakar for their timely help.

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DIKSHA GUPTA

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# DEGRADATION OF ANTIBIOTICS IN THE ENVIRONMENT

(REVIEW)

A Dissertation Report submitted for the partial fulfilment of the requirement of the

**Award of Degree**

OF

**MASTER OF SCIENCEE IN BOTANY**

At

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## CERTIFICATE

This is certify that dissertation entitled “**Degradation of antibiotics in the environment (REVIEW)**”, is based on review of literature work done by **Diptesh Kumar Bhoi** (Enrollment No.- GGV/19/3139) Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G. and this has not previously formed the basis of the award of any degree, diploma, associate ship and any other similar title and it represents entirely an independent work on the part of the candidate.

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## DECLARATION

I, **Diptesh Kumar Bhoi**, hereby declare that the work presented in the project work entitled **Degradation of antibiotics in the environment (REVIEW)** submitted for the partial fulfilment of M.Sc. Botany has been performed in the Dept. of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur under the supervision of Dr. V.N. Tripathi, Assistant Professor, Dept. of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur, (C.G.).

The work presented in this project dissertation is original and remain intellectual property of Department of Botany, Guru Ghasidas Vishwavidyalaya, (C.G.).

The information presented in the dissertation report including data and tables are original, or duly credited. If any discrepancy, mistake or plagiarism found in the report, the responsibility for the same will be solely mine.

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## **ACKNOWLEDGEMENT**

It is my great pleasure to express my sincere gratitude to my supervisor **Dr. V.N. Tripathi**, Assistant professor, Department of Botany, GGV, Bilaspur (C.G.), under whose guidance the present project work has been completed. His valuable time, valuable suggestions and selfless effort helped me a lot in completing the work.

I wish to acknowledge **Dr. S.K. Shahi**, HOD, Dept. of Botany, GGV, Bilaspur (C.G.), who gave me opportunity to undergo project work.

I would like to thank **Dr. A.K. Dixit, Dr. D.K. Patel, Dr. S.K. Pandey, Dr. S.K. Prajapati, Dr. S. Shweta, Dr. R.K. Ahirwar, and Dr. Deepanker Yadav** for their kind encouragement.

I would like to thank **Mr. Naresh Chandrakar** and **Mr. Suresh Nirmalkar** who always helped me in every situation during my project work.

I would like to thank all Ph.D. scholars of botany department for their time to time support during my project work.

I would like to thank Narsingh Bag, Uttam Ku. Jena, Gayatri Biswal, Indulata Choudhary and all my family members for their support in all adverse situation.

*I would like to thank all my classmates and those who have directly or indirectly helped me to complete my work.*

**Name-Diptesh Kumar Bhoi**



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## EFFECTOR PROTEINS IN BACTERIAL PATHOGENESIS AND THEIR T4SS MECHANISM (REVIEW)

A Dissertation Report submitted in partial fulfillment of the requirement of the

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MASTER OF SCIENCE IN BOTANY

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This is certify that the dissertation entitled "Effector proteins in bacterial pathogenesis and their t4ss mechanism (REVIEW)", is based on review of literature work done by Gayatri Devi Biswal (Enrollment no.-GGV/16/3125) Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G. and this has not previously formed the basis of the award of any degree, diploma, associateship and any other similar title and it represents entirely an independent work on the part of the candidate.

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A handwritten signature in black ink, appearing to read 'Sushil Khat', is written over a white rectangular background.

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## ACKNOWLEDGEMENT

With the utmost esteem, I would like to pay my special regards to my supervisor Dr. V.N. Tripathi, Assistant Professor of Botany, for his encouragement and guidance during this project work. I would like to concede respect for his consistent support and his insight knowledge to the subject matter helped me the most. His valuable time, suggestions and selfless effort helped me a lot in completing the work.

I am also grateful to the Head of the Department, Dr. S.K. Shahi for his dedication towards encouraging the students and gave me opportunity to undergo my project work entitled “Role of T4S effector proteins of in pathogenicity (REVIEW)” within this department.

Special thanks to faculty members of the Department, Dr. S. Shweta and Dr. Deepanker Yadav for their kind encouragement.

I would like to thank Ms. Shivali Sharma (Ad-hoc) and Ms. Nikita Sahoo (Senior) to spare their precious time to help me throughout this project.

I would like to thank all my classmates for helping me to complete this project work.

I would like to thank those who have directly or indirectly contributed to the successful completion of this project work.

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# ETHNOBOTANICAL STUDY OF DHARAMJAIGARH BLOCK DISTRICT RAIGARH (A REVIEW)

A Dissertation Report

Submitted  
For the fulfilment of the degree  
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MASTER OF SCIENCE  
IN  
BOTANY



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### CERTIFICATE

This is to certify that dissertation entitled "Ethnobotanical study of Dharamjaigarh block district Raigarh (A Review)" is based on original work done by Gopal Patel (Enrollment no. GGV/16/3126) Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur under the guidance of Dr. R.K. Ahirvar from the Department of Botany, GGV, Bilaspur and the report has not been submitted to any other University for the award of any Degree or Diploma.

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## DECLARATION

I hereby declare that the work presented in this dissertation Report entitled "Ethnobotanical study of Dharamjaigarh block district Raigarh (A Review)" submitted for the partial fulfilment of M.Sc. Botany was carried out at Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) The work was carried out by me under the guidance of Dr. Ramesh Kumar Ahirvar, Assistant Professor, department of Botany, Guru Ghasidas Vishwavidyalaya Bilaspur (CG.). The work in this dissertation Report is original and will remain intellectual property of department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (CG.).

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## ACKNOWLEDGEMENT

I am grateful to my project supervisor Dr. R.K. Ahirwar for the guidance, inspiration and constructive suggestions that helped me in preparation of this project. Special thanks to all the teachers in the Department namely Dr. S. K. Shahi, Dr. A. K. Dixit, Dr. D. K. Patel, Dr. S. K. Pandey Dr. V. N. Tripathi, Dr. R. K. Ahirwar, Dr. Deepanker Yadav, Dr. S. Subhramanyam, Dr. M. P. Shahi, Dr. Vinit Kumar, Dr. Preeti Verma, Ms. Shivali Sharma for their great contribution to enrich my knowledge.

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**Gopal Patel**



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**A Review on– medicinal uses of *Prosopis cineraria***

**A DISSERTATION**

Submitted in the fulfillment of the requirement for the award of the degree

Of

Master of Science in Botany

To



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By

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### CERTIFICATE

This is to certify that dissertation entitled *A review on – medicinal uses of Prosopis cineraria* based on original work done by **Himanshi** (Enrollment no- GGV/16/3130) Department of Botany, GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, and this has not been previously formed the basis of the award any degree, diploma, associated ship and other similar title and it represent an entirely independent work of the candidate.

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## Acknowledgement

With the outmost appreciation, I would like to concede respected supervision **Dr. S.K Pandey** for his guidance, selfless effort, sparing his precious time for guidance and supervision and always being ready for pointing out mistakes and giving suggestion to improve them.

I am also grateful to head of department **Dr. S.K Shahi** for his declaration towards the pursue of knowledge and readiness to instill the same in his student has always been encouraging.

Special thanks to the teacher in the department, namely **Dr A.K dixit, Dr. V.N tripathi, Dr. Ramesh kumar ahirwar, Dr. S. Shweta, Dr. Deepankaryadav, Dr. Devendra Kumar Patel and Dr. S.K. Prajapati** for encouragement during the study and also **Ankesh Tiwari sir (Ph.Dscholar)**.

I am also thanks to my friends for help in making these project a successful one.

Last but not least I convey my regards to all those who directly or indirectly contributed to the successful completion of this project work.

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**ENVIRONMENTAL EFFECT OF COAL  
MINING INDUSTRY**  
A Dissertation Report  
**SUBMITTED ON THE PARTIAL FULFILMENT OF  
THE DEGREE  
OF  
MASTER OF SCIENCE  
IN  
BOTANY**



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## CERTIFICATE


This is certify that dissertation entitled “ENVIRONMENTAL EFFECT OF COAL MINING INDUSTRY” submitted to the Department of BOTANY, GGV is a record of independent dissertation work carried out by **Indramani Painkra** for the degree of Master of Science under my supervision and guidance. This has not been previously submitted for the award of any degree diploma or any other similar title.

  
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## DECLARATION

I hereby declare that the work presented in this project dissertation entitled “**ENVIRONMETAL EFFECT OF COAL MINING INDUSTRY**” Submitted for partial fulfillment of M. Sc. Botany was carried out at Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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The work in this project dissertation is original and will remain intellectual property of department of Botany, Guru Ghasidas Vishwavidyalaya Bilaspur (C.G.). I will be only responsible for any content of the dissertation.

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## ACKNOWLEDGEMENT

First and foremost, I express my deepest gratitude to my supervisor Dr. S. Prajapati, Assistant Professor, Department of Botany, GGV, Bilaspur, C.G., India; whose inspiration, supervision and support and encouragement to complete my dissertation work entitled “**ENVIRONMENTAL EFFECT OF COAL MINING INDUSTRY**” from preliminary to concluding level on this project. I also thank for his kindness, timely cooperation and guidance for this project.

I would like to thanks Dr S. K. Shahi, Head of the Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C. G) for providing all the necessary facilities during the course of study.

Special thanks to my all teachers in the department, namely Dr. A. K Dixit, Dr. S.K. Pandey, Dr. V.N. Tripathi, Dr. S. Shweta, Dr. Amar Abhishek, Dr. Vinita Dixit, Mr C Dewangan and all the faculties of the department for their guidance and encouragement during the study.

I am also thankful to all my classmates for sharing their literature and valuable assistance.

Finally, yet importantly, I take this opportunity to express my gratitude and love towards my parents and beloved family members, for their understanding, support and encouragement to give in this dissertation.

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NOISE POLLTION

RADIOACTIVE EXPOSURE

GREENHOUSE GAS EMISSION

WILD LIFE

SOIL EROSION

CLIMATE CHANGE

Conclusion

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# Bioremediation of medical waste

(REVIEW)

A Dissertation Report submitted for the partial fulfilment of the requirement of the

Award of Degree

OF

MASTER OF SCIENCE IN BOTANY

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)



2020-2021

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## CERTIFICATE

This is certify that dissertation entitled “**Bioremediation of medical waste (REVIEW)**”, is based on review of literature work done by **Indulata Choudhary** (Enrollment No.- GGV/16/3132) Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G. and this has not previously formed the basis of the award of any degree, diploma, associate ship and any other similar title and it represents entirely an independent work on the part of the candidate.

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I, **Indulata Choudhary**, hereby declare that the work presented in the project work entitled "Bioremediation of medical waste (REVIEW)" submitted for the partial fulfilment of M.Sc. Botany has been performed in the Dept. of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur under the supervision of Dr. V.N. Tripathi, Assistant Professor, Dept. of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur, (C.G.).

The work presented in this project dissertation is original and remain intellectual property of Department of Botany, Guru Ghasidas Vishwavidyalaya, (C.G.).

The information presented in the dissertation report including data and tables are original, or duly credited. If any discrepancy, mistake or plagiarism found in the report, the responsibility for the same will be solely mine.

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## **ACKNOWLEDGEMENT**

It is my great pleasure to express my sincere gratitude to my supervisor **Dr. V.N. Tripathi**, Assistant professor, Department of Botany, GGV, Bilaspur (C.G.), under whose guidance the present project work has been completed. His valuable time, valuable suggestions and selfless effort helped me a lot in completing the work.

I wish to acknowledge **Dr. S.K. Shahi**, HOD, Dept. of Botany, GGV, Bilaspur (C.G.), who gave me opportunity to undergo project work.

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I would like to thank all Ph.D. scholars of botany department for their time to time support during my project work.

I would like to express my heartfelt gratitude to my family for giving me the moral support and a lot of encouragement for carrying out my work.

I would like to thank all my classmates and those who have directly or indirectly helped me to complete my work.

**Indulata Choudhary**



## CONTENT

1. Introduction;- What is bioremediation and medical waste, Classification of medical waste.
2. Review of literature
3. Bioremediation technique and different methods
4. Bioremediation applications
5. Advantage of bioremediation
6. Disadvantage of bioremediation
7. Limitations of bioremediation
8. Conclusion
9. Reference

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A Dissertation Report

SUBMITTED FOR

THE PARTIAL FULFILMENT OF THE DEGREE OF

MASTER OF SCIENCE IN BOTANY



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## DECLARATION

I here declare that the work presented in this project dissertation entitled "**A Monograph On *Butea monosperma***" submitted for partial fulfillment of M.Sc Botany was carried out at Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G).

The work was carried out by me under supervision of **Dr. A.K. Dixit**, Assistant Professor, Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G). The work in this project dissertation is original and will remain intellectual property of department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G).

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## AKNOWLEDGEMENT

With the all most appreciation, I would like to concede respected supervision Dr. A. K. Dixit for his guidance, selfless efforts, sparing their precious time for guidance and supervision and always being ready for pointing out mistakes and giving suggestions to improve them.

I am highly thankful to honorable Dr.S.K. Shahi, Head of Botany department, GGV, Bilaspur for his dedication towards the pursue of knowledge and readiness to instill the same.

Special thanks to the teachers in the Department namely Dr. S.K. Pandey, Dr. S.K. Prajapati, Dr.V.N.Tripathi, , Dr. Amar Abhishek , Dr. Veenita Dixit , Dr. Ramesh Kumar Ahirwar, Dr. Sweta Subhramanim , Ms. Shivali Sharma and during the study.

No words can suffice the efforts taken by my parents for the completion of my project. This work is an outcome of their blessing & constant moral support.

Finally I am thankful from the bottom of my heart to my classmates who encouraged me at each step with great affection.

Last but not least I convey my regards to all those who directly or indirectly contributed to the successful completion of this project work.

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# ANALYSIS OF GLOBAL RESEARCH ON MALARIA AND A REVIEW OF ANTIMALARIAL PLANTS

A Dissertation Report  
SUBMITTED  
FOR THE PARTIAL FULFILMENT OF THE DEGREE  
OF  
MASTER OF SCIENCE  
IN  
BOTANY



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## ACKNOWLEDGEMENT

With the utmost appreciation, I would like to concede respected supervisors **Dr. S.K. Shahi** for their guidance, selfless efforts, sparing their precious time for guidance and supervision and always being ready for pointing out mistakes and giving suggestions to improve them. I am highly thankful to honourable **Dr. SK Shahi, Head of Botany & Dean of Life Science, GGV, Bilaspur** for his dedication towards pursue of knowledge and readiness to instill the same.

Special thanks to the teachers in the Department, namely, **Dr. .A.K. Dixit, Dr. S.K. Prajapati, Dr. S.K. Pandey, Dr. V.N .Tripathi, Dr. M.P. Shahi** add other also for encouragement during the study.

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No words can suffice the efforts taken by my parents for the completion of my project. This work is an outcome of their blessing & constant moral support.

Finally I am thankful from the bottom of my heart to my classmates **Subhangi Maity, Tripti Sharma, Lalita Sahu, and Riya Reshma Tirkey** who encouraged me at each step with great affection.

Last but not least I convey my regards to all those who directly or indirectly contributed to the successful completion of this project work.

**Lajbanti Mishra.**



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4. Results and discussion
5. Conclusion
6. References

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# ETHNOBOTANICAL, PHYTOCHEMICAL, AND PHARMACOLOGICAL STUDY OF INDIAN HERBAL QUEEN-*TINOSPORA CORDIFOLIA* (GILOY)

A Dissertation Report

SUBMITTED

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OF

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## ACKNOWLEDGEMENT

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I am also like to thanks the lab technician and librarian Mr Naresh Chandraker & Nirmalkar for help in making this projects a successful one.

No words can suffice the efforts taken by my parents for the completion of my project. This work is an outcome of their blessing & constant moral support.

Finally I am thankful from the bottom of my heart to my classmates Riya Reshma Tirkey, Shalini kiran kushwaha, Himanshi, Madhulata, Tripti Sharma, Lajbanti Mishra, and Subhangi Maity. Who encouraged me at each step with great affection.

Last but not least I convey my regards to all those who directly or indirectly contributed to the successful completion of this project work.

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# THE GENUS *CROTALARIA* L. (LEGUMINOSAE): CYTOLOGICAL REVIEW

Dissertation Report Submitted  
For the partial fulfilment of the degree of

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IN  
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CERTIFICATE

This is to certify that the project report entitled "The Genus *Crotalaria* L. (Leguminosae): Cytological Review" is an authentic record of work done by Lokesh Kumar Bharti Student of M.Sc. Botany in the Department of Botany of this Vishwavidyalaya.

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I hereby declare that the work presented in the projected dissertation entitled "The genus *Crotalaria* L. (Leguminosae): Cytological review" submitted as partial fulfilment of M.Sc. Botany IV Semester, was carried out by me at Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.).

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It is a great pleasure for me to pay earnest thanks and profound gratitude to my supervisor, Dr. S. Shweta, Assistant Professor, Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G) for giving me an opportunity to work under her supervision at this esteemed University and for regular discussions on the topic.

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I am indebted to my parents, brothers and friends for their moral support and encouragement during the course of work.

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*Sushille Shah*



**ETHNOMEDICINAL PLANTS USED BY THE TRIBES OF RAIGARH  
DISTRICT CHHATTISGARH INDIA: A REVIEW**

**A DESERTATION REPORT  
SUBMITTED  
For the Fulfilment of the degree  
of  
MASTER OF SCIENCE  
IN  
BOTANY**



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This is to certify that dissertation entitled “Ethnomedicinal Plants used by the tribes of Raigarh district Chhattisgarh India: A Review” is based on original work done by Madhulata Behra (Enrollment no. GGV/16/3145) Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur under the guidance of Dr. R.K. Ahirwar from the Dept. of Botany, GGV, Bilaspur and the report has not been submitted to any other University for the award of any Degree or Diploma.

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## ACKNOWLEDGEMENT

The satisfaction of the successful completion of any task will be incomplete without the mention of people who has constantly guided, cooperated and encouraged me with all efforts. I am grateful to my project supervisor **Dr. Kumar Ahirwar** for the guidance, inspiration and constructive suggestions that helped me in preparation of this project.

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**Madhu Lata Behra**



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# WATER POLLUTION IN LEATHER INDUSTRY

A

Dissertation Report

SUBMITTED ON THE PARTIAL FULFILMENT OF

THE DEGREE OF

MASTERS OF SCIENCE

IN

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I declare that the work done in my dissertation entitled, "Water Pollution In Leather Industry" has been carried out by me and does not involve plagiarism. I also certify that: No sentence, equation, diagram, table, paragraph, or section has been copied verbatim from previous work unless it is placed under quotation marks and duly referenced. The project work will remain the intellectual property of the Department of Botany, Guru Ghasidas Vishwavidyalaya Bilaspur (C.G.).

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## ACKNOWLEDGEMENT

First and foremost, I express my deepest gratitude to my supervisor Dr. Santosh Kumar Prajapati, Associate Professor, Department of Botany, GGV, Bilaspur, C.G., India; whose inspiration, supervision, and support and encouragement to complete my dissertation work entitled “WATER POLLUTION IN LEATHER INDUSTRY” from preliminary to concluding level on this project. I also thank him for his kindness, timely cooperation, and guidance for this project.

I would like to thank Dr. S. K. Shahi, Head of the Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C. G) for providing all the necessary facilities during the course of study.

Special thanks to all my teachers in the department, namely Dr. A. K Dixit, Dr. S.K. Pandey, Dr. V.N. Tripathi, Dr. S. Shweta, Dr. Amar Abhishek, Dr. Vineeta Dixit, Dr. Deepanker Yadav, Mr. C Dewangan, and all the faculties of the department for their guidance and encouragement during the study.

I am also thankful to all my classmates for sharing their literature and valuable assistance.

Finally, yet importantly, I take this opportunity to express my gratitude and love towards my parents and beloved family members, for their understanding, support, and encouragement to give in this dissertation.

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A handwritten signature in black ink, appearing to read 'Sunil K. Shukla', is written over a white rectangular background.



**ETHNOMEDICINAL PLANTS USED TO TREAT GYNAECOLOGICAL  
DISORDERS BY TRIBAL PEOPLE IN NARSINGHANATH VALLEY OF  
BARGARH DISTRICT ODISHA (A REVIEW)**

A DISSERTATION REPORT  
SUBMITTED  
FOR THE FULFILMENT OF THE DEGREE  
OF  
MASTER OF SCIENCE  
IN  
BOTANY



BY  
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## ACKNOWLEDGEMENT

I express my sincere gratitude and indebtedness to my advisor Assistant professor Dr. R.K. Ahirwar Department of botany, under whose guidance & kind supervision give to me throughout the dissertation work which shaped the present work as its shows. I also owe a depth of appreciation and gratitude to my respected teachers in the department namely Dr.A.K. Dixit, Dr.S.K. Shahi, Dr. D.K. Patel, Dr.S.K. Pandey, Dr.S.K. Prajapati, Dr.V.N. Tripathi, Dr. Deepanker Yadav, Dr.Sweta Subhramanyam, Dr.Amar Abhisek, Dr.M.P. Shahi, Dr. Vinit Kumar, Dr.Preeti Verma, Dr. Shivali Sharma.

I also want to acknowledge our lab technician & librarian Mr. Naresh Chandrakar for their help.

I won't Forget to mention my classmates & friends for their wonderful and skillful guidance and support.

Last, but not the least, I also thank my parents for their moral support to ensure successful completion of the project.

**Manish Padhee**



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“**A**biotic stress and its eradication in ***Glycine max*** (soyabean).”

A Dissertation report submitted for the fulfilment of the degree of  
MASTER OF SCIENCE IN BOTANY



SESSION 2020-2021  
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## CERTIFICATE

This is to certify that the dissertation entitled "Abiotic stress and its management in *Glycine max* (soyabean)." based on the review work done by Ms. Mousumee Mahapatra, M. Sc IV semester Department of Botany, Guru Ghasidas Vishwavidyalaya, Koni, Bilaspur (C.G.) and this has not previously formed the basis for the award of any degree, diploma, associate ship, fellowship or any other similar title and it represents entirely an independent work of the candidate.

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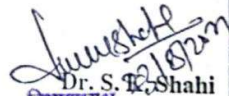
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I hereby declare that the work presented in this dissertation entitled "Abiotic stress and its management in *Glycine max* (soyabean).", submitted for the partial fulfilment of M.Sc.Botany as carried out at Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur(C.G.).

The work was carried out by me under the supervision of Dr. S.K.Pandey Assistant Professor, Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.).The work presented in this dissertation is original and will remain intellectual property of Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.). If any discrepancy, mistake and plagiarism is found in the report, the responsibility for the same will be solely mine.

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## ACKNOWLEDGEMENT

I am extremely thankful and express my sincere gratitude to my supervisor **Dr. S.K. Pandey** Assistant Professor Department of Botany G.G.V. Bilaspur Chhattisgarh India, whose encouragement, supervision and support from the preliminary to the concluding level enabled me to develop an understanding of the subject.

I express my deepest gratitude to **Dr. S. K. Shahi** Head of Department of Botany, Guru Ghasidas Vishwavidyalaya, for granting permission and providing me with an environment to complete my project successfully within the department.

I would also like to thank all my teachers including **Dr. A.K. Dixit, Dr. D. K. Patel, Dr. S K Prajapati, Dr. V.N. Tripathi, Dr. Deepanker Yadav, Dr. R.K. Ahirwar, and Dr. Shweta Subhramanian**, for their encouragement and suggestions that helped me to complete my dissertation successfully.

I am also thankful to all my classmates who helped and supported me during entire study.

I fail to collect words to acknowledge **Ms. Astha Tirkey** (Research Scholar) for helping me in my dissertation work and have always played a supportive role in providing me an opportunity to gather information at academic level.

Finally, yet importantly, I take this opportunity to express my gratitude to all Research Scholars, my parents and beloved family members, for their support and encouragement to do my work more efficiently during the crucial times.

Date: 25-07-2021

**Mousumee Mahapatra**

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# OPPORTUNISTIC PATHOGENS

(REVIEW)

A Dissertation Report submitted for the partial fulfilment of the requirement of the

Award of Degree

OF

MASTER OF SCIENCE IN BOTANY

At

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)



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## CERTIFICATE

This is certify that dissertation entitled “**Opportunistic Pathogen (REVIEW)**”, is based on review of literature work done by **Narasingh Bag** (Enrollment No.- GGV/19/3244) Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G. and this has not previously formed the basis of the award of any degree, diploma, associate ship and any other similar title and it represents entirely an independent work on the part of the candidate.

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## DECLARATION

I, Narasingh Bag, hereby declare that the work presented in the project work entitled **OPPORTUNISTIC PATHOGEN (REVIEW)** submitted for the partial fulfilment of M.Sc. Botany has been performed in the Dept. of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur under the supervision of Dr. V.N. Tripathi, Assistant Professor, Dept. of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur, (C.G.).

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I would like to thank **all my teachers including Dr. A.K. Dixit, Dr. S.K. Prajapati, Dr. S. K. Pandey, Dr. Amar Abhishek, . Dr. S. Shweta and Dr. Deepanker Yadav** for their kind encouragement.

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*I would like to thank all my classmates and those who have directly or indirectly helped me to complete my work.*

**Name:-Narasingh Bag**





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**A**  
**DISSERTATION**  
**ON**  
**A REVIEW ON MEDICINAL PLANT *ASPARAGUS***  
***RACEMOSUS* AND *ACORUS CALAMUS* Submitted**  
**for the partial fulfilment of the requirements for**  
**the award of the degree of**

**MASTER OF SCIENCE**

**In**

**BOTANY**

**To**

**GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C. G.)**



**By**

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## CERTIFICATE

This is to certify that the dissertation entitled "A review on medicinal plant *Asparagus racemosus* and *Acorus calamus*" is based on the review work done by Ku. Poonam Walive, student of M.Sc. 4th Semester Botany, Guru Ghasidas Vishwavidyalaya, Koni, Bilaspur (C.G.). Further, this is also certified that the content of this work has not been submitted or published for the award of any degree, diploma or any other similar title and represents entirely an independent work done by candidate.

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## DECLARATION

I, **Poonam walive** hereby declare that the work presented in the project dissertation entitled "**A review on medicinal plant *Asparagus racemosus* and *Acorus calamus***" submitted for partial fulfilment of M.Sc. Botany has been carried out at Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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## ACKNOWLEDGMENT

I am very grateful to Dr. S.K Shahi, Head of department, Botany and faculty of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur for their constant encouragement.

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Special thank you to all teachers of the department namely, Dr. A.K Dixit, Dr. D.K. Patel, Dr. S. K. Pandey, Dr. S. K. Prajapati, Dr. R. K. Ahirwar, Dr. S. Shweta, Dr. M. P. Shahi, Dr. P. Varma, Dr. Vineet Kumar and Ms. Shivali Sharma for encouragement during the study.

I express my heartfelt gratitude to my family for giving me the moral support and a lot of encouragement for carrying out my work.

I also thank to my friends who have done different works related to my topic and extending their support.

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DECLARATION  
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**DECLARATION**

**A REVIEW ON SALT STRESS AND PLANTS DEFENCE**

**A Dissertation  
Report**

**SUBMITTED ON THE PARTIAL FULFILMENT OF  
THE DEGREE OF MASTER OF SCIENCE  
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## DECLARATION

I declare that the work presented in this thesis "a review on salt stress and plants defence" submitted in partial fulfilment of MSc. Botany has been carried out at the Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G).The work presented in this thesis is original and will remain the intellectual property of Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G). The information presented in this dissertation report including data, figures and picture are original and duly credited. If any discrepancy, mistake, or plagiarism found in this report, the responsibility for the same will be solely mine.

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## ACKNOWLEDGEMENT

First and foremost, I express my deepest gratitude to my supervisor Dr. Deepanker Yadav, Assistant Professor, Department of Botany, GGV, Bilaspur, C.G., India; whose inspiration, supervision, and support and encouragement to complete my dissertation work entitled A REVIEW ON SALT STRESS AND PLANTS DEFENSE from preliminary to concluding level on this project. I also thank him for his kindness, timely cooperation, and guidance for this project.

I would like to thank Dr. S. K. Shahi, Head of the Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C. G) for providing all the necessary facilities during the course of study.

Special thanks to all my teachers in the department, namely Dr. A. K Dixit, Dr. S.K. Pandey, Dr. SK Prajapati, Dr. V.N. Tripathi, Dr. S. Shweta, Dr. Amar Abhishek, Dr. Vineeta Dixit, Mr. C Dewangan, and all the faculties of the department for their guidance and encouragement during the study.

I am also thankful to all my classmates for sharing their literature and valuable assistance.

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#### 1.1 salt stress

### 2. EFFECTS OF SALT STRESS ON PLANT

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- d. Effects of salt stress on photosynthetic pigments e. Effect in photosynthesis

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  - i. Antioxidative mechanism
    - A. Enzymatic
    - B. Non-enzymatic
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### 4. CONCLUSION

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A  
**DISSERTATION**  
ON  
**A REVIEW ON ALOE VERA AND TRIGONELLA FOENUM -  
GRAECUM**

*Submitted for the partial fulfilment of the requirement for the  
award of the degree of*

**MASTER OF SCIENCE IN BOTANY**

TO

**GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C. G.)**



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## **ACKNOWLEDGEMENT**

With the out most appreciation, I would like to concede respected supervisor's Dr. Devendra Kumar Patel for his guidance, selfless effort, sparing his precious time for guidance and supervision and always being ready for pointing out mistakes and giving suggestion to improve them.

I am also grateful to Head of Department Dr. S.K. Sahi for his dedication towards the pursue of knowledge and readiness to instill the same in his student has always been encouraging.

Special thanks to the teacher in the department, namely Dr. A.K. Dixit, Dr.V.N. Tripathi, Dr. Deepankar Yadav, Dr.Ramesh Kumar Ahirwar , Dr. S. Sweta for encouragement during the study.

I am also thanks to qZ friends for help in making these projects a successful one.

Last but not least I convey my regards to all those who directly or indirectly contributed to the successful completion of this project work.

**Pragati Verma**



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**SEED DISPERSAL MECHANISMS IN THE  
SUB-FAMILY PAPILIONOIDEAE  
(LEGUMINOSAE)**

**Dissertation Report**

**Submitted**

**For the partial fulfilment of the degree of**

**MASTER OF SCIENCE**

**IN**

**BOTANY**



**By**

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**CERTIFICATE**

This is to certify that the project report entitled **“Seed dispersal mechanisms in the Sub-family Papilionoideae (Leguminosae)”** is an authentic record of work done by **Puja Bhoi**, Student of M.Sc. Botany in the Department of Botany of this Vishwavidyalaya.

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## DECLARATION

I hereby declare that the work presented in the projected dissertation entitled "Seed dispersal mechanisms in the Sub-family Papilionoideae (Leguminosae)" submitted as partial fulfilment of M.Sc. Botany IV Semester, was carried out by me at Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.).

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## ACKNOWLEDGEMENTS

I would like to express my heartfelt thanks and immense gratitude to all those who helped and encouraged me to complete my dissertation entitled “**Seed dispersal mechanisms in the Sub-family Papilionoideae (Leguminosae)**” as partial fulfilment of the degree of Master of Science in Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G).

It is a great pleasure for me to pay earnest thanks and profound gratitude to my supervisor, Dr. S. Shweta, Assistant Professor, Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G) for giving me an opportunity to work under her supervision at this esteemed University and for regular discussions on the topic.

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I am indebted to my parents, sister and friends for their moral support and encouragement during the course of work.

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# **EFFECT OF LIGHT POLLUTION ON ENVIRONMENT**

A Dissertation Report

**SUBMITTED ON THE PARTIAL FULFILMENT OF  
THE DEGREE**

**OF**

**MASTER OF SCIENCE**

**IN**

**BOTANY**



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I hereby declare that the work presented in this project dissertation entitled "EFFECT OF LIGHT POLLUTION ON ENVIRONMENT" Submitted for partial fulfillment of M. Sc. Botany was carried out at Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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## ACKNOWLEDGEMENT

First and foremost, I express my deepest gratitude to my supervisor Dr. Santosh Kumar Prajapati, Assistant Professor, Department of Botany, GGV, Bilaspur, C.G., India; whose inspiration, supervision and support and encouragement to complete my dissertation work entitled “**EFFECT OF LIGHT POLLUTION ON ENVIRONMENT**” from preliminary to concluding level on this project. I also thank for his kindness, timely cooperation and guidance for this project.

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**CONTENT:**

A). Introduction

B). Types of Light Pollution

1. Over Illumination

2. Glare

3. Light Clutter

4. Sky Glow

5. Light Trespass

C). Sources & Causes of Light Pollution

D). Effect of Light Pollution

1. Effects on Environment

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3. Effects on Animals

4. Effects on Human Health

5. Effects on Astronomy

6. Effects on Air Pollution

E). Solution of Light Pollution

F). Conclusion

G). Reference

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**A DISSERTATION ON**  
**REVIEW ON MEDICINAL PLANT OCIMUM**  
**SANCTUM AND EMBLICA OFFICINALIS**

Submitted for the Partial Fulfilment  
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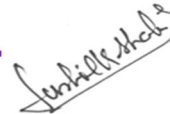
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This is certify that dissertation entitled A REVIEW ON MEDICINAL PLANTS *OCIMUM SANCTUM* AND *EMBLICA OFFICINALIS* is work done by Rinki Padhan , Depart of botany, GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR. And this has not been previously formed of any degree, Diploma, associated ship and other similar titled and is represent entirely an independent work of the candidate.

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## ACKNOWLEDEMENT

The satisfaction and euphoria accompany the successful completion of any task would be incomplete without mentioning the people who made it possible. So, with gratitude I acknowledge all those guidance and encouragement made to successful complete this project.

I take this opportunity to express my sincere thanks to my supervisor **Dr. Devendra Kumar Patel** who have been a constant source of inspiration and strength to me through my study. It is a great pleasure to acknowledge my sincere thanks to **Dr. Devendra kumar Patel**, Department of Botany, **GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR**, for their valuable feedback and suggestion.

I am also grateful to head of department **Dr.S.K Sahi** for his dedication towards the pursure of knowledge and readiness to instill the name of the student has always been encouraging.

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### Chapter-2: TULSI PLANT *OCIMUM SANCTUM*

- . Review of literature
- . Material and methods
- . Plant profile
- . Chemical constituents
- . Traditional uses
- . Mode of preparation
- . Conservation status

### Chapter-3: AMLA *EMBLICA OFFICINALIS* PLANT: -

- . Review of literature
- . Material and methods
- . Plant profile
- . Chemical constituents
- . Traditional uses
- . Mode of preparation
- . Conservation status
- . CONCLUSION: -
- . REFERENCES: -



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Monograph of *Celosia agrentea* L

A Dissertation

Submitted in partial fulfilment of the requirement for the award of degree

Master of science

In  
BOTANY  
To

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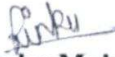
I hereby declare that the work presented in this project dissertation entitled “**Monograph of *Celosia argentea L* “** submitted for partial fulfilment of M.Sc ,Botany was carried out at Department of Botany , Guru Ghasidas Vishwavidyalaya , Bilaspur (C.G)

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With the out most appreciation, I would like to concede respected **DR.A.K.DIXIT** for his guidance, selfless efforts, sparing, his precious time for giving suggestion to improve my work.

I wish to express my sincere gratitude to **DR.S.K.SHAHI** , Head of department ,Botany, GGV for his persistent encouragement, constant guidance, and supervision from the concept of the project work.

Special thanks to the teachers namely,Dr.S.K.Prajapati,Dr .S.K. Pandey,Dr. V.N .Tripathi, Dr .D.K.Patel, Dr. Deepanker.Yadav, Dr. R.K .Ahirwar, Dr .S .Subramaniam for encouragement during the study.

I express my heartfelt gratitude to my **Parents and family** for giving me the moral support and a lot of encouragement for carrying out my work.

I also thanks my **friends** who have done different works related to my topic and extending their support.

Last, but not the least, I thanks **God** who has been with me in all paths of my life.

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# ETHNOBOTANICAL, PHYTOCHEMICAL, AND PHARMACOLOGICAL STUDIES ON KARANJA [*Pongamia pinnata*]

A DISSERTATION REPORT  
SUBMITTED  
FOR THE PARTIAL FULFILMENT OF THE DEGREE  
OF  
MASTER OF SCIENCE  
IN  
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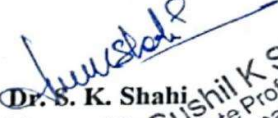


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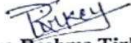
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I am also like to thanks the lab technician and librarian Mr Naresh Chandraker & Nirmalkar sir for help in making this projects a successful one.

No words can suffice the efforts taken by my parents for the completion of my project. This work is an outcome of their blessing & constant moral support.

Finally I am thankful from the bottom of my heart to my classmates **Lalita sahu, Shalini kiran Kushwaha, Subhangi Maity, Lajbanti Mishra, Tripti Sharma** who encouraged me at each step with great affection.

Last but not least I convey my regards to all those who directly or indirectly contributed to the successful completion of this project work.

**Riya Reshma Tirkey**



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# Ethno medicinal, traditional and economical importance of *Madhuca longifolia*



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The work was carried out by me under the supervision of Dr.S.K.Pandey Assistant Professor, Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.). The work presented in this dissertation is original and will remain intellectual property of Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.). If any discrepancy, mistake and plagiarism is found in the report, the responsibility for the same will be solely mine.

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**Saranjeet Kour Bali**





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# A REVIEW ON DROUGHT STRESS AND PLANT DEFENSE

**A Dissertation Report**

Submitted to the Guru Ghasidas Vishwavidyalaya

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**For the partial fulfillment of the award of the degree of**

**MASTER OF SCIENCE**

**IN**

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The work presented in the project report is original and has not been submitted anywhere else for this or any other degree.

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## DECLARATION

I declare that the work presented in this thesis "A REVIEW ON DROUGHT STRESS AND PLANT DEFENSE" submitted in partial fulfilment of M.Sc. Botany has been carried out at the Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G).

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I am highly thankful to all the teachers in the department, namely, Dr. S.K. Shahi (Head of the department Botany), Dr. A.K. Dixit, Dr. D.K. Patel Dr S.K. Prajapati, Dr S.K. Pandey, Dr V.N. Tripathi, Dr. M.P. Shahi, Dr. S. Shweta, Dr. R.K. Ahirwar for the encouragement.

I am also like to thanks the lab technician and librarian Mr. Nirmalkar and Mr. Naresh Chandrakar helping me in the project work.

I am thankful from bottom of my heart to my all classmates for their wonderful support during my project work.

No words can suffice the efforts taken by my parents and family for the completion of my project. This work is outcome of their blessing and their moral support.

Last but not the least I convey my regards to all those who directly or indirectly contributed to the successful completion of this project work.

**SHALINI KIAN KUSHWAHA**



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**SYSTEMATIC REVIEW OF THE GENUS *DERRIS* L.  
(LEGUMINOSAE)**

**Dissertation Report Submitted  
For the partial fulfilment of the degree of**

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BOTANY**



**By**

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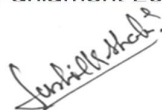
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## ACKNOWLEDGEMENTS

I wish to express my heartfelt thanks and immense gratitude to all those who helped and encouraged me to complete my dissertation entitled “**Systematic review of the genus *Derris* L. (Leguminosae)**”, as partial fulfilment of the degree of Master of Science in Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G).

It is a great pleasure for me to pay earnest thanks and profound gratitude to my supervisor, Dr. S. Shweta, Assistant Professor, Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G) for giving me an opportunity to work under her supervision at this esteemed University and for regular discussions on the topic.

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**CHARACTERISTICS OF ROOT NODULE AND  
BIOLOGICAL NITROGEN FIXATION IN *ASTRAGALUS***

**Dissertation Report**

**Submitted**

**For the partial fulfilment of the degree of**

**MASTER OF SCIENCE  
IN  
BOTANY**



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This is to certify that the project report entitled "**Characteristics of Root Nodule and Biological Nitrogen Fixation in *Astragalus***" is an authentic record of work done by Soumya Shephalika Tripathy student of MSc Botany of Guru Ghasidas Vishwavidyalaya.

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## ACKNOWLEDGEMENTS

I wish to express my heartfelt thanks and immense gratitude to all those who helped and encouraged me to complete my dissertation entitled **“CHARACTERISTICS OF ROOT NODULE AND BIOLOGICAL NITROGEN FIXATION IN *ASTRAGALUS*”**, as partial fulfilment of the degree of Master of Science in Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G).

It is a great pleasure for me to pay earnest thanks and profound gratitude to my supervisor, Dr. S. Shweta, Assistant Professor, Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G) for giving me an opportunity to work under her supervision at this esteemed University and for regular discussions on the topic.

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**DIFFERENT ASPECTS OF POLLINATION  
MECHANISM IN SOME PLANTS OF SUB –  
FAMILY PAPILIONOIDEAE**

**Dissertation Report Submitted  
For the partial fulfilment of the degree of  
MASTER OF SCIENCE IN  
BOTANY**



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This is to certify that the project entitled report "DIFFERENT ASPECTS OF POLLINATION MECHANISM IN SOME PLANTS OF SUB-FAMILY PAPILIONOIDEAE" is an authentic record of work done by Srikanta Seth student of M.Sc. Botany of Guru Ghasidas Vishwavidyalaya.

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## ACKNOWLEDGEMENTS

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# STUDY OF POTENTIAL DRUGS AND PLANT MOLECULES AGAINST COVID-19

**A Dissertation Report  
SUBMITTED  
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OF  
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IN**



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**Subhangi Maity.**



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  - 2.10. Role of inhibitor found in marine databases Mpro.
3. Materials and Methods
4. Results
5. Discussion
6. Conclusion
7. References

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# ROLE OF GENETIC ENGINEERING IN BETTER CROP GROWTH: A REVIEW

(A dissertation report)

SUBMITTED ON THE PARTIAL FULFILMENT THE DEGREE

Of MASTER OF SCIENCE

IN BOTANY



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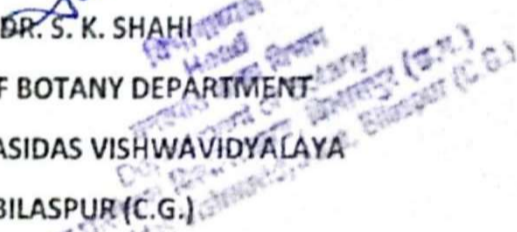
This is certify that the dissertation entitled "Role of genetic engineering in better crop growth: A Review" of based on the original work done by TEJESHWARI SAHU Department of Botany, GGV, Koni, Bilaspur (C.G) and this is not previously formed the basis for the awarded of any degree, diploma, associateship, fellowship or any other similar title and it represents entirely an independent work of the candidate.

  
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I hereby declare that the work presented in this project dissertation entitled " **Role of Genetic Engineering in Better Crop Growth: A Review** "submitted for partial fulfillment of M.sc. Botany was carried out at department of botany GGV Bilaspur ( C.G).

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## **Acknowledgement**

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I'd like to express my gratitude to **Dr. S. K. SHAHI**, director of the botany department at GGV, Bilaspur (C.G), for providing all of the essential facilities during my studies.

Dr. A. K. Dixit, Dr. S. K. Pandey, Dr. V. N. Tripathi, Dr. S. Shweta, and all the faculty members of the department deserve special gratitude for their advice and encouragement during the year.

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Finally, and most importantly, I'd like to take this occasion to show my thanks and affection for my parents and other loved ones for their patience, support, and encouragement in helping me achieve my goals.

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A  
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*“A REVIEW ON RAUWOLFIA SERPENTINA AND DIOSCOREA ALATA”*  
SUBMITTED FOR THE PARTIAL  
FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF  
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This is to certify that the dissertation entitled "*A REVIEW ON RAUWOLFIA SERPENTINA AND DIOSCOREA ALATA*" is based upon the original work done by Ms. **Tripti Chatterjee, M.Sc. IVth Semester**, Department of Botany, Guru Ghasidas Vishwavidyalaya, Koni, Bilaspur (C.G.) and this has not been previously formed the basis for the award of any degree, diploma, associate ship, fellowship or any other similar title and it represents entirely on independent work of the candidate.

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## ACKNOWLEDGEMENT

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*I express my heartfelt gratitude to my family for giving me the moral support and a lot of encouragement for carrying out my work.*

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A REVIEW ON THE PHARMACOLOGICAL PROPERTIES OF SOLANUM NIGRUM

A

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### 3. Material and Methods

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- 3.3 Preliminary TLC screening for steroidal alkaloid production
- 3.4 HPLC quantification of Solamargine-

### 4. Result

### 5. Discussion

### 6. Conclusion

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## Chemical Signals in Quorum Sensing

(REVIEW)

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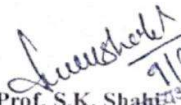
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**Uttam Kumar Jena**



## Contents

- ❖ Introduction
- ❖ Quorum sensing of Gram-negative bacteria
- ❖ Quorum sensing of Gram-positive bacteria
- ❖ Quorum Quenching or Quorum sensing Inhibition
- ❖ Quorum sensing Application in different field of Significance
- ❖ Conclusion

A handwritten signature in black ink, appearing to read 'Sushil K. Shukla', is written over a white rectangular area.

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# CRISPR-CAS biology, mechanism and application in genome editing



SESSION 2019-2021

DEPARTMENT OF BOTANY

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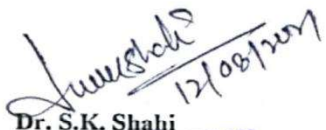
  
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## ACKNOWLEDGEMENT

I am extremely thankful and express my sincere gratitude to my supervisor **Dr. S.K. Pandey** Assistant Professor Department of Botany G.G.V. Bilaspur Chhattisgarh India, whose encouragement, supervision and support from the preliminary to the concluding level enabled me to develop an understanding of the subject.

I express my deepest gratitude to **Dr. S.K. Shahi** Head of Department of Botany, Guru Ghasidas Vishwavidyalaya, for granting permission and providing me with an environment to complete my project successfully within the department.

I would also like to thank all my teachers including **Dr. A.K. Dixit, Dr. Devendra Kumar Patel, Dr. S.K. Prajapati, Dr. V.N. Tripathi, Dr. Deepanker Yadav, Dr. S.Sweta** and **Dr. R.K. AHIRWAR** for their encouragement and suggestions that helped me to complete my dissertation successfully. I thank **Mr. N. Chandrakar** and **Mr. S. Nirmalkar** our lab technician who have been very kind to arrange and kept track of all the lab supplies.

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I fail to collect words to acknowledge **Ms. Mohineeta Pandey** (Research Scholar) for helping me in my dissertation work and have always played a supportive role in providing me an opportunity to gather information at academic level.

Finally, yet importantly, I take this opportunity to express my gratitude to all Research Scholars, my parents and beloved family members, for their support and encouragement to do my work more efficiently during the crucial times.

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A  
DISSERTATION  
ON  
“A REVIEW ON *TINOSPORA CORDIFOLIA* AND *TERMINALIA ARJUNA*”  
SUBMITTED  
FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD  
OF  
MASTER OF SCIENCE  
IN  
BOTANY  
TO  
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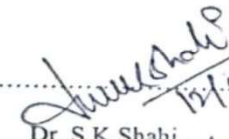
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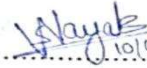
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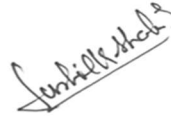
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First and foremost, I would like to express my deepest gratitude to respected supervisor Dr. Devendra Kumar Patel, Associate Professor, Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.), for his constant support, guidance, supervision and providing me an environment to complete my dissertation successfully.

I am highly thankful to respected Head of the Department Dr. S. K. Shahi, Associate Professor for giving whole facilities that makes my dissertation work possible. I would also like to thank faculty members of the department, namely Dr. A. K. Dixit, Dr. S. Prajapati, Dr. S. K. Pandey, Dr. V. N. Tripathi, Dr. R. K. Ahirwar, Dr. Deepanker, Dr. S. Shweta, Dr. M. P. Shahi, Dr. Veenit Kumar and Dr. Preeti Verma for their encouragement during study.

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**EFFECT OF ACID RAIN ON SOIL QUALITY**  
A Dissertation Report  
**SUBMITTED ON THE PARTIAL FULFILMENT OF**  
**THE DEGREE**  
**OF**  
**MASTER OF SCIENCE**  
**IN**  
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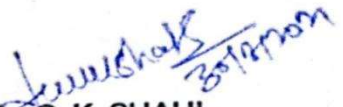
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## ACKNOWLEDGEMENT

First and foremost, I express my deepest gratitude to my supervisor Dr. S. Prajapati, Associate Professor, Department of Botany, GGV, Bilaspur, C.G., India; whose inspiration, supervision and support and encouragement to complete my dissertation bwork entitled “ **EFFECT OF ACID RAIN ON SOIL QUALITY**” from preliminary to concluding level on this project. I also thank for his kindness, timely cooperation and guidance for this project.

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I would like to thanks Dr S. K. Shahi, Head of the Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C. G) for providing all the necessary facilities during the course of study.

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Finally, yet importantly, I take this opportunity to express my gratitude and love towards my parents and beloved family members, for their understanding, support and encouragement to give in this dissertation.



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A Dissertation report  
Submitted  
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(VIMLESH KUMAR KURREY)



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# A REVIEW ON EFFECT OF HEAVY METAL STRESS ON GROWTH AND YIELD OF RICE

Dissertation submitted to the

Guru Ghasidas Vishwavidyalaya

For the partial fulfilment for the award of the degree of

**Master of Science in Botany**

By

**Yogendra Kumar Netam**

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### DECLARATION

I declare that the work presented in this thesis "A Review On Effect Of Heavy Metal Stress On Growth And Yield Of Rice" submitted in partial fulfilment of Master of Science Botany has been carried out at the Department of Botany, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G).

The work presented in this thesis is original and will remain the intellectual property of Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G). The information presented in this dissertation report including data, figures, and pictures are original and duly credited. If any discrepancy, mistake, or plagiarism found in this report, the responsibility for the same will be solely mine.

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**Netam**

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