Karnatak University's,
KARNATAK SCIENCE COLLEGE, DHARWAD
NAAC Accredited
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3.5.2.1 - Number of functional MoUs with Institutions of national, international importance, other universities, industries, corporate houses etc. year wise during the year .

I) MOU activities of Computer Science Students with Apponix Technologies

Orientation Program on Emerging Technologies in IT Sector

Department of Computer Science Organised a Orientation Program"Emerging Technologies in IT Sector" for BCA studentson 01-04-2023.

Department Head briefly explained main objective of the program followed by resource persons introduction.

Resource Person explained BCA course gives knowledge of basic computing skills and software development but in this commutative environment it will be help full for the student if he/she knows current technologies. The major objective of the programme was to give the introduction of current technologies. Resource Persons to the program are Mrs. Maimuneesa K and Mr. Mathew John from Apponix Technologies.Resource persons covered the following topics:

- Artificial Intelligence (AI)
- Internet of Things (IoT)
- Machine Learning (ML)
- 5G Networks
- Edge Computing
- 3D Printing
- Robotics and Automation

Mrs. Maimuneesa K from Apponix Technologies explaining about Emerging Technologies in IT Sector

II) MOU activities of Microbiology Students at Nichrome Testing Laboratory and Research Pvt, Ltd, Dharwad. Duration: 15/03/2022 to 14/05/2022

Title of Project:"Bioremediation of Cadmium and Chromium from Industrial Effluents by Indigenous Bacteria" – A Prudent and Innovative approach towards the Swachh Bharat Mission.

Name of the students:

1. **Mr. Anirudha Kulkarni – BSc V Sem, Microbiology**
2. **Miss. Divya Holeyachi – BSc V Sem, Microbiology**

MOU activity Duration: 22/04/2022 to 14/05/2022 (2022-23)

Guide Teacher: Mr. Ambarish Sindagi, Lecturer, Department of Microbiology attended the guided for the project.

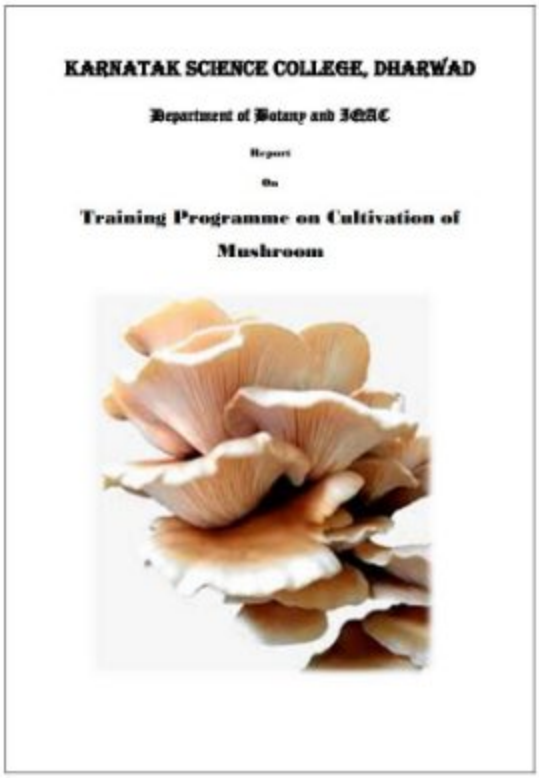
Project Report : Heavy metals like Cadmium and Chromium are usually more persistent than the other metals that cannot be easily degraded in the environment and there are high chances of these contaminants entering the food chain which can cause major health issues. It is a more comprehensive interdisciplinary approach to bring lab-scale bioremediation process to large-scale technology that will be acceptable by industries across the nation. The present study deals with isolation, identification and characterization of Cadmium and Chromium heavy metal resistant bacterial strains from contaminated soils in and around the Belur Industrial Area, Dharwad, Karnataka. Total of 10 bacterial strains were screened, out of which four bacterial strains were selected based on the highest luxurious growth and acclimatized at 600mg and 400mg for Cd and Cr metal concentration respectively. Based on the morphology and biochemical characterization, the bacterial isolates BIDS II, IV belongs to *Pseudomonas* and BIDS VI belong to *Serratia* and BIDS I belong to *Bacillus*. These four bacterial isolates showed high metal tolerance and optimum growth at 30°C for pH 7.0. The *Bacillus* (BIDS I) and *Pseudomonas* (BIDS II)showed maximum removal of Cd (87%and 78%) and Cr (83% and 75%) after 72hours of incubation respectively. The bacterial isolates *Pseudomonas* (BIDS IV) and *Serretia*(BIDS VI) could efficiently remove Cd (72% and 70%) and Cr (69% and 65%) after 72hours of incubation respectively. The *Pseudomonas*spand *Bacillus*sp strains are promising and significantly used for bio-removal of Cd and Cr from industrial effluents with minimum cost and high efficiency. These strains are efficiently reducing the BOD, COD and other chemical parameters up to 80% from industrial effluents. It can be successfully implemented as a bioremediation technology in Effluent Treatment Plants (ETP), cleansing drinking water and large-scale control of water pollution in developing nations. It gives an additional dimension to the so-called **"Green Technology"** as the proposed technique is eco-friendly.This novel bioremediation technology is relevance to the society with the saying Recycle, Reuse and Recreate. The biomass created during this study can be used as biofertilizers. This bioremediation technology will support **"Swachh Bharat Mission"** of Government of India for the waste water cleanup technology.

Research Project Activity Outcome:

For the this project work**Mr. Anirudh Kulkarni** awarded as **Best Juvenile Innovator/Inventor** during the **Regional IYIIC-2021 held at** Regional IYIIC-2021 event, which was held on 16th and 17th April 2022 at Gulbarga University, Kalaburgi, organized jointly by **National Council for Science and Technology Communication (Department of Science and Technology), Government of India, New Delhi**, **NOSTC** (Network of Organization for Science, Technology and Communication), New Delhi and **Karnataka Rajya VijnanaParishat (KRVP)** at Gulbarga University, Kalaburgi and got selected for the **National Event of IYIIC** held on **27th** and **28th May - 2022** at **Sigma University, Vadodara, Gujarat**.

III) MOU activities of Botany Students with VKF Agri Ltd, Dharwad.

REPORT ON MUSHROOM CULTIVATION

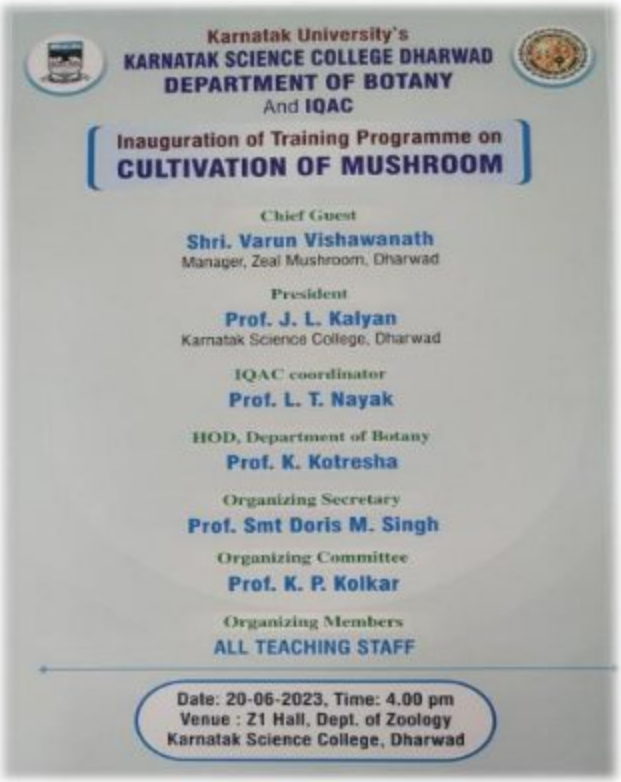

KARNATAK SCIENCE COLLEGE, DHARWAD

Department of Botany and IQAC

Report

On

Training Programme on Cultivation of Mushroom



INAUGURAL FUNCTION:

The Mushroom Cultivation programme begun with the Registration of students from all disciplines of the Karnatak Science College. Nearly 72 students from various subjects like Botany, Zoology, Microbiology, Biotechnology, Geology, Chemistry registered for the training programme.

It was on 20.06.2023 at 4.00 pm at Z1 hall, the inauguration of the Training programme commenced with welcoming the Guests and students by Dr. K P Kolkar. Chief guest Shri Varun Vishwanath, Manager, Zeal Mushroom, Dharwad addressed the eager students who were all set to learn the cultivation of oyster mushroom. The Chief guest spoke on the threats and challenges during the cultivation of mushroom on large scale. How he managed to develop various techniques and packaging skills during the large scale of cultivation. He also stressed on how he has developed an innovative value added product like mushroom jam which is the first of the kind in India. This encouraged the students to learn a new technique so that they too could be small entrepreneurs of mushroom farming. Principal Prof. J. L. Kalyan presided over the function; and Prof. L.T. Nayak, IQAC Coordinator spoke

on the importance of this kind of Training Programmes for the students. The organizing Secretary Prof. (Smt) Doris M. Singh spoke about the workshop which attracted the registered students to spend time on learning new techniques apart from their daily routine of class room. These programmes help students to develop their skills and evoke them to understand importance of small scale entrepreneurship and development of value added products. Student participant Mujamil Surfraj proposed the vote of thanks.

INTRODUCTION:

Mushroom is nothing but the Basidiocarps (fruiting bodies) of the Basidiomycetes which is a class of the fungi. They are fascinating organisms with over 1000 of species having different shapes. The mycelium grows underground while the Basidiocarps grows above the ground. Growing mushrooms ourselves is the safest way for eating mushrooms because we can see exactly the type of mushroom we are growing. Growing mushroom is a logical step as we can really learn more about their life cycle as we are doing the cultivation. In nature it just sprouts from underground mycelium but it actually requires the decomposed leaves, tree trunks and with the help of Mycorrhizal fungi. Mushrooms are nutritious having high protein, fiber, minerals and fat free, and also delicious which is pure vegetarian.

PROCEDURE:

PREPARATION OF STRAW

Paddy straw is cut into 1 inch size and steeped over night in clean water. The hay is drained off from water and sterilized with a pinch of fungicide at 121^0C for 15 minutes, cooled after autoclaving.

INOCULATION:

The hay is filled into polypropelene bags in layers. Taking sterilized hay and filling in small quantities at a time before putting the next layer, the spawn is inoculated to the sides of the hay, in between the hay and the bag. Likewise the hay is filled to three fourth of the bag. The bag is sealed and small pores are made in the bag and kept in the dark for 21 days and Sprayed alternating days with water. Mycelium develop and fill the bags as white patches and then later completely throughout the bag.

BASIDIOCARP DEVELOPMENT:

When the mycelium has developed throughout the hay the bags are cut open and the whole pack of hay tightly interwoven with mycelium are hung by rope allowing further development giving way to basidiocarp to grow. At this time light is given for its development (12 hrs light and 12 hrs dark) and spraying of water is continued for 21 days.

HARVESTING :

Within a week fingerlike projections arise which bloom into large sized basidiocarps.

1st HARVEST per bag. :- The crop obtained was 557 gms.

2nd HARVEST per bag. :- The crop obtained was 358 gms.

3rd HARVEST per bag :- The crop obtained was 255 gms.

MARKETING:

The Students requested that they would like to market their product to get hand on training on cultivation and finally marketing their cultivated mushrooms.

OPINION OF STUDENTS:

Name: Sharvan Pujari

Class: B.Sc. IV

I would like to express my thanks to our college and beloved lecturers for giving me an opportunity to perform good project work. I learnt so many things about 'Mushroom Cultivation' while growing. I have enhanced my knowledge in Mushroom Cultivation. I hope to be a good entrepreneur.

Name: Fakkiresh B.K.

Class: B.Sc. IV

I am very happy to share my opinion about Mushroom Cultivation programme organized in our Botany Department, KSCD. I am very much thankful to our beloved lecturers Dr. (Smt.) Doris M. Singh mam, and Dr. Veena mam and also our college for giving such a wonderful opportunity.

I learnt many skills in this activity; this programme enhanced the understanding of mycology and their applications.

Name: Manjunath. Anegundi

Class: B.Sc. IV

I would like express opinion about Mushroom Cultivation, in our college organized Mushroom Cultivation programme under the guidance of Dr. (Smt.) Doris M. Singh mam, and Dr. Veena mam. We learnt the procedure of Mushroom Cultivation and we got good results, and it was enriching initiative that combined theoretical knowledge with hands on experience and also empowering participants to explore Mushroom Cultivation with confidence.

Thanks for giving this opportunity.

ACKNOWLEDGEMENT:

As a team the Organizing Secretary and students would like to thank Principal for supporting the training programme financially. We thank IQAC Coordinator for initiating the training programme. We thank HOD for providing space for mushroom cultivation. And last but not least the sources of all inspiration and overall success of the Training Programme we would like to thank Ms. Veena Rokhade.

Inaugural function of Mushroom Cultivation

Watering the plant by Guest

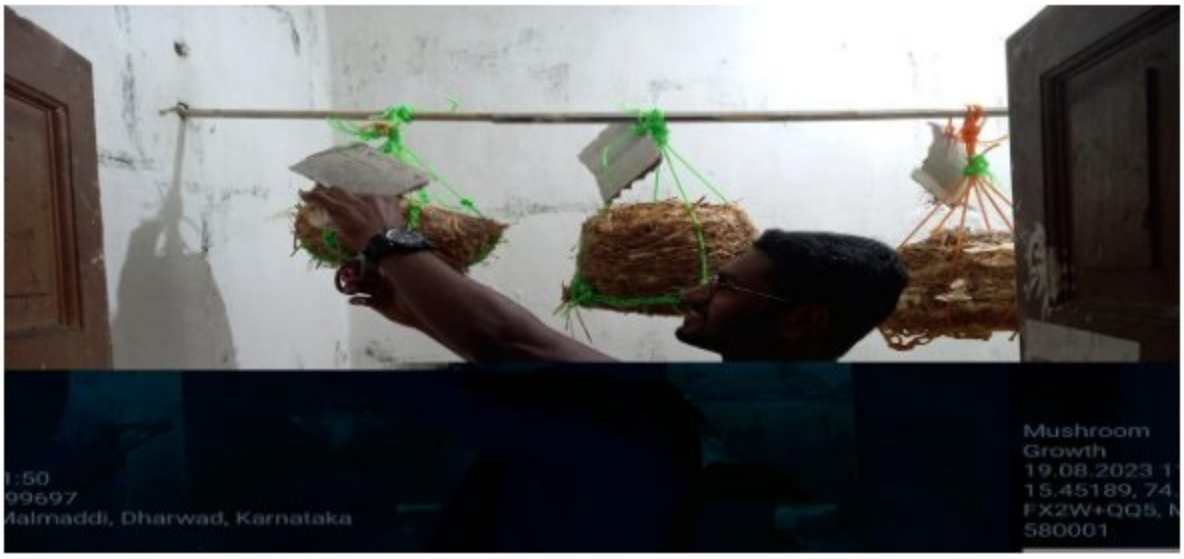
Cutting of straw to one inch for mushroom cultivation

Sterilization of paddy straw

Process of Spawning (Batch I)

Process of Spawning (Batch II)

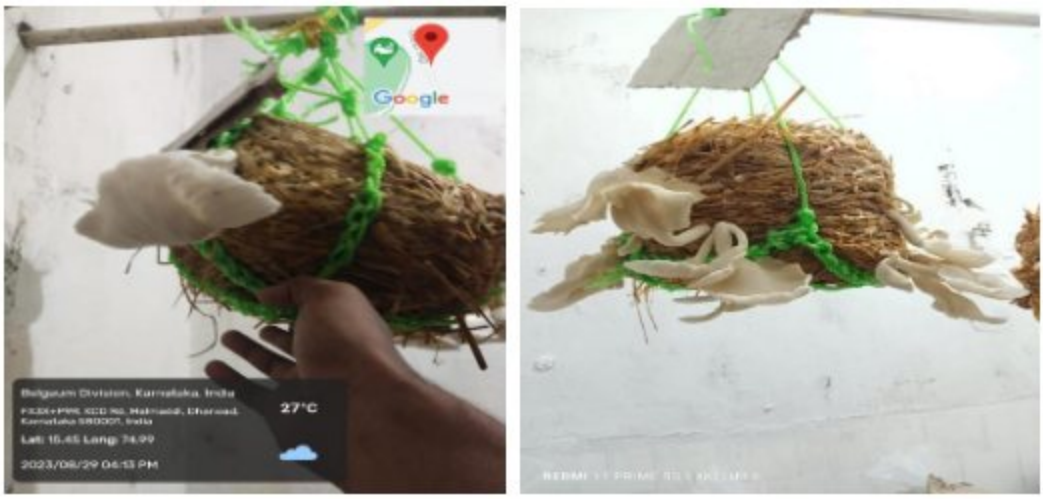
Development of Mycelia in bag



Hanging of mushroom bags, removing of bags after initiation of mushroom growth (Batch III)

Naming of bags by different batches

Initial Pin Head stages of Oyster Mushroom



Development of Basidiocarps and Growth of Mushroom after 21 days

Growth of Mushroom after 30 Days

Harvesting the Mushroom after 32 days

Harvesting of Mushroom after 32 days

Weighing of harvested Mushroom

Packing of Mushroom

Submission of harvested Mushroom to course coordinator and staff

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CERTIFICATE

This is to certify that Ms./Mr. _____ has actively participated in the training programme on "MUSHROOM CULTIVATION" conducted by Dept. of Botany in association with IQAC, Karnatak Science College, Dharwad.

Organizing Secretary Head IQAC Coordinator Principal

Certificate

IV) **MOU activity With NTLR-Green,Environment and Energy Audit**

NTLR

ACCREDITED ORGANIZATION
TESTING / ENGINEERING / CONSULTING / TRAINING

NICHROME TESTING LABORATORY AND RESEARCH PRIVATE LIMITED
170, 2nd Main Road, Narayanpur, Dharwad – 580008, Karnataka
Email : nicechem@gmail.com, website : www.nichromelabs.com

NABL ACCREDITED (ISO/IEC 17025:2017), MOEF RECOGNISED, ISO 9001:2015, ISO 45001:2018 CERTIFIED

CERTIFICATE OF GREEN AUDIT

This is to certify that ,**KARNATAKA SCIENCE COLLEGE, DHARWAD-580004**, Karnataka, has been innovative with new ideas to accomplish Eco-Friendly environment in the campus.
The organization has undergone ' Green Audit, Environment Audit and Energy Audit ' for the period **2022-2023**, and found satisfactory. Campus meets the requirements.

Dr. Krishna Kulkarni
Managing Director.

Shrikant Joshi
Environmental Auditor

V) **MOU activity With KLE Society ,Hubli**

District Level ONe Day PFMS TRaining Programme.

Date : 19-07-2022. Place : Karnatak Science College Dharwad.

No of Volunteers: 70.

one day District Level PFMS training Programme Conducted at P C Jobin College Hubli in which staff of the college participated.

Dr. Mangalawade, from Karnatak Science college addressing the gathering at P.C.Jobin College, Hubballi