# Indian Science Technology and Engineering facilities Map

# (I-STEM)

**Invites application for**

1. **Partial financial support for using R&D facilities in other institutions through the I-STEM web portal to Users from Academic Institutions and Start-ups (Format-1)**

***Format for requesting support for accessing and using facilities through the I-STEM web portal.***

**(i) Details of the Personal Information**


**a.** Name of the Faculty Member: **Dr. Goutam Dutta**
**b.** Name of the Institution: **Prabhat Kumar College Contai**
**c.** Name of the Department: **Physiology**
d. Degree registered for/Product being developed (for start-up)
e. Mob. No. **7908979146** f. Email ID: **emailgdutta@gmail.com**


(ii) **Project/Research topic Details**:

a. Project Title/Research Title: **Qualitative and quantitative assessment of edible mushroom cultivated in medicinal plant's extract containing bed material.**

b. Sub area: **Nutritional Physiology**

c. Area Description: **Botanical aspect on Physiology**

d. Aims & Objective (in Bullets):

**Aims:**

- To cultivate the edible mushroom on medicinal plant extract containing bed materials.
- To identify the active compounds of those medicinal plants in cultivated edible mushroom
- To identify the nutrient continents of those cultivated edible mushroom on medicinal plant extract containing bed materials.
- To identify the quantity of mushroom cultivated on medicinal plant extract containing bed materials compared to normal conventional bed materials.

**Objectives:**

- Qualitative assessment of the mushroom from pining to maturation
- NMR study of the cultivated mushroom powder to identify the active compound of medicinal plants
- Measurement of nutrient contents of the cultivated mushroom to assess the quality of the edible mushroom
- SEM study to identify the qualitative aspect of the morphology

e. Duration (MM/YYYY):**06 months**

f. **Project Summary (1000 words):**


Edible mushroom is very common to all for its nutritional benefit. In the literature, there are reports of nutritional contents of different species of edible mushroom. The quantity and quality of cultivated edible mushroom is depends on the cultivation environments like, temperature, humidity and bed materials. There are also reports in literature that the quality and quantity of cultivated mushroom is depends on the bed materials. Therefore,

the preparation and selection of bed materials is very important for edible mushroom cultivation. In the present study, there will be an effort to cultivate the edible mushroom in a new approached bed material. The extract of medicinal plants will be used during the preparation of bed materials. In this way, the active compounds of the medicinal plants may transfer into the mushroom. The active compound of the used medicinal plant may be identified by NMR study in a comparative approach. There are also possibilities of the changes of nutrients continents of that cultivated mushroom compared to that of conventional mushroom cultivated in paddy straw bed materials. Therefore, in the present study, some common medicinal plants extract will be used during the preparation of paddy straw bed materials and the *Pleurotus sajor-caju* will be cultivated on that manipulated bed materials. After maturation, the dust of the mushroom will be studied to identify the presence of the active compounds of those medicinal plants in the mushroom.

**References:**


- R.S. Aparna, G Heera, ST Susha, SJ Sreeja, 2022. **Effect of medicinal plant extracts on mycelial growth of Pleurotus florida**, Mushroom Research 31 (1) : 109-112, 2022
- El-Wakil, D,A,.Abdel Latef, A.A.H., Youssef, N.H. 2022. **Bioactive Compounds and Antifungal Activity of Leaves and Fruits Methanolic Extracts of Ziziphus spina-christi L. Plants.** 2022, 11, 746. https://doi.org/10.3390/ plants11060746
- Gwa, V,I., Nwankiti A,O., Ekefan, E,J., 2018. **Antifungal Effect of Five Aqueous Plant Extracts on Mycelial Growth of Penicillium Expansum Isolated from Rotted Yam Tubers in Storage**. Acta Scientific Agriculture. Vol. ,2 Issue 6.
- Wani, B, A., Bodha, R, H., Wani, A, H., 2010. **Nutritional and medicinal importance of mushrooms**. Journal of Medicinal Plants Research. Vol. 4(24), pp. 2598-2604.
- Agata Fijałkowska , Bożena Muszyńska1, Katarzyna Sułkowska-Ziaja , Katarzyna Kała , Anna Pawlik , Dawid Stefaniuk , Anna Matuszewska , Kamil Piska , Elżbieta Pękala , Piotr Kaczmarczyk , Jacek Piętka, Magdalena Jaszek. **Medicinal potential of mycelium and fruiting bodies of an arboreal mushroom Fomitopsis ofcinalis in therapy of lifestyle diseases**., www.nature.com/scientificreports


(Separate page may be attached to justify the requirements)

g. **Technical Details**

**a. TRL**

**b. Methodology**

- Preparation of Media
- Preparation of Spawn
- Preparation of plant extraction (3 common medicinal plants)
- Preparation of Paddy straw bed materials with that plant extract.
- Cultivation of mushroom from pinning to maturation
- Qualitative assessment of the mushroom from pining to maturation
- Storage of matured mushroom and preparation of mushroom dust
- NMR study of the cultivated mushroom powder to identify the active compound of medicinal plants

- Measurement of nutrient contents of the cultivated mushroom to assess the quality of the edible mushroom
- SEM study to identify the qualitative aspect of the morphology

**c. Design & development:**

- *Pleurotus sajor-caju* will be used as experimental mushroom
- 03 common medicinal plants **(*Azadirachta indica, Justicia adhatoda, Gymnema sylvestre)*** water extract will be used in three separate experiments i.e., each plant extract will be in separate bed.
- Control: Common paddy straw bed materials (03 bed will be prepared)
- Experiment 01: Medicinal Plant 01 extract containing paddy straw bed materials (03 bed will be prepared).
- Experiment 02: Medicinal Plant 02 extract containing paddy straw bed materials (03 bed will be prepared).
- Experiment 03: Medicinal Plant 03 extract containing paddy straw bed materials (03 bed will be prepared).
- Optimum temperature and humidity will be provided for the cultivation of *Pleurotus sajor-caju*
- After maturation of the mushroom on the experimental bed, the dust of that experimental mushroom will be compared qualitatively and quantitatively with control only paddy straw bed materials mushroom.

**d. Facilities and Instrumentation required:**

- NMR, GC-MS, FTIR

**e. Consumables (Scientific materials)**

Chemicals required for Mushroom Cultivation and Assessment:
(Mother culture, NMR Chemicals (Dimethyl sulfoxide and Chloroform-d), NMR tubes, Calcium Carbonate, Calcium Sulphate, Agar, Dextrose, Wheat or paddy grains, poly propylene packet, Gypsum, Paddy straw)

**Expected output and outcome**

- The active compounds of the used medicinal plants may incorporate into the fruit bodies of the mature mushroom
- By the biotransformation process into the mushroom, we may get the new highly active bioactive compound.
- The nutrient contents of the experimental mushroom may be altered
- Double benefit will be gifted to the society as the medicinal mushroom with a good source of protein
- The popularity of the mushroom will be enhanced

h. **Industry/Institute Collaboration** **YES**

(i) Name of the Collaborating Institute: Central research facilities, Indian Institute of Technology, KGP

(ii) Collaboration Details: NMR, GC-MS, FTIR will be studied in Central research facilities, Indian Institute of Technology, KGP

(iii) Additional Details if any: NO

i. **Funding required from I-STEM (with justification):**

**Details of Requirements & Mode of the Engagement: Total Project Cost: 105000.00**

******(The quotation for the consumables is attached herewith)**

**(i) Short term Engagement:**

**a. Usage of testing/characterization facilities across the country (Characterization Mode)**

**i. Testing Charges: 80000.00**

**a. NMR study: 35,000.00**

**b. GC-MS Study:35,000.00**

**c. FTIR Study: 10,000.00**

**ii. Consumable charges: 20,000.00 (Quotation is attached herewith)**

**iii. Travel Cost (Boarding and Lodging, if any): 5000.00**

| Total Cost of the Proposed Project (Rs.) | Funding required from I-STEM (Rs.) | Other sources of remaining funding (Rs.) |
|---|---|---|
| **105000.00** | **100000.00** | **5000.00 (From College Research Fund)** |

~~b. Usage of fabrication and testing facilities across the country (Fabrication Mode)~~

~~i. Fabrication and testing Charges~~

~~ii. Consumable charges (if any)~~

~~iii. Travel Cost (Boarding and Lodging, if any)~~

~~(ii) Medium term Engagement:~~

~~a. Execution of project in any one of the Host Institution (Project Mode)~~

~~a. Fabrication and or testing Charges~~

~~b. Consumable charges (if any)~~

~~c. Travel Cost (Boarding and Lodging, if any)~~

~~b. Execution of project in Multi Host Institutions (Project Mode)~~

~~a. Fabrication and or testing Charges~~

~~b. Consumable charges (if any)~~

~~c. Travel Cost (Boarding and Lodging, if any)~~

***(Round-trip to the Host Institution by 2nd class (Non-AC) railway via the nearest route)***

Details of User's Bank Account:

*(Please send a copy of the cancelled cheque/copy of the passbook carrying all the information needed)*

Beneficiary Name (User's name): GOUTAM DUTTA PAN: BBNPD9999J

Bank Account No. 911010037148016 Name of the Branch: Axis Bank

IFSC Code: UTIB0000325

***Note: Proposed proposal must be executed within stipulated duration (max. 6 month) to avoid fund availability issues. Travel form will be provided by the I-STEM office. The users will submit the technical report, original invoice (duly signed by the Head of the Institution) raised by the Host Institution through I-STEM portal only along with a copy of the travel forms and original tickets through post to the Nodal Officer, I-STEM, Indian Institute of Science, Bangalore. A scan copy of all the documents may be sent in advance.***

AXIS BANK LTD

| | | | |
|---|---|---|---|
| Account Type | :Savings Account | | |
| Account Number | :911010037148016 | Branch Code | :325 |
| Customer Id | :839967542 | Branch Name | :MIDNAPUR [WB] |
| Customer Name | :GOUTAM DUTTA | Branch Address | :37/3, STATION ROAD, MIDNAPUR |
| Joint Holder 1 | :MRS SOUMITA DUTTA | | DIST: PASCHIM MEDINI PUR |
| Joint Holder 2 | : | | MIDNAPUR (WEST BENGAL) - 721101. |
| A/c Open Date | :21-07-2011 | | |
| Address | :NUTANBAZAR GHATIBABUR BAGAN PS KOTWALI DT | | |
| | PASCHIM MIDNAPUR | | |
| | MIDNAPUR (WEST BENGAL) - 721101. | | |
| | | Tel No (Branch) | :03222-324102/103/104 |
| | | Swift Code | : |
| Mob No | :+91()9475891184 | MICR Code | :721211302 |
| Res Tel No | : | IFSC Code | :UTIB0000325 |
| Nomination | :Registered | | |
| Nomination Name | :HIMANSHU DUTTA | Phone Banking | :18001035577/18002095577/18002335577 |

QUOTATION

# CHAULIA EQUIPMENTS & CHEMICALS

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| To | Ref No: | C.E.C=00129/22-23 |
|---|---|---|
| Dr, Goutam Dutta | Date:- | 16/08/2022 |
| Assistant Professor & HOD | Enquiry No: | Verbal |
| Pravhat Kumar College | Date: | 13/08/2022 |
| Dept of Physiology | | |
| Contai, Purba Medinipur. | | |

Respected Sir,

With reference to your mention enquiry we are quoting lowest possible rate for your approval and hope to receive your valued order.

**BOTANY LABORATORY**

| SLNO | DESCRIPTION | MAKE | UNIT | RATE |
|---|---|---|---|---|
| 1. | Mother culture of pleurotus sajor-caju from NIMPITH, west bengal | Tube | 1No | 1000.00 |
| 2. | Dimethyl sulfoxide | Imported | 50gm | 7361.00 |
| 3. | Chloroform -d | Sigma | 50gm | 1500.00 |
| 4. | NMR tubes -5mm | Imported | 1EA | 2,000.00 |
| 5. | Calcium carbonate | Merck | 500gm | 390.00 |
| 6. | Calcium sulphate | Merck | 500gm | 510.00 |
| 7. | Agar | Himedia | 500gm | 4,905.00 |
| 8. | Dextrose | Merck | 500gm | 560.00 |
| 9. | Wheat or paddy straw | Best Quality | 50kg | 750.00 |
| 10. | Gypsum (Calcium sulphate Dihydrate) | Loba | 500 gm | 320.00 |
| 11. | Non Absorbent cotton | B.C | 1Roll | 170.00 |
| 12. | Poly propylene packet for bed (80 gauge) | G/Q | 1kg | 500.00 |
| 13. | | | | |

| TERMS OF SALES | |
|---|---|
| 1.Validity | : Up to 31March-23 |
| 2.GST | : - GST=Including |
| 3.Delivery | : - Within 60Days. |
| 4.Payment | : - Against delivery. |
| 5. Email | : - chaulia_chemicals@rediffmail.com |

Proprietor

Signature

Chaulia Equipments Chemicals

Goutam Dutta