

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: Aveek Samanta
- b. Name of the Institution: Prabhat Kumar College Contai
- c. Name of the Department: Botany
- d. Degree registered for/Product being developed (for start-up)
- e. Mob. No.08918426639
- f. Email ID:aveek02samanta@gmail.com

(ii) Project/Research topic Details:

- a. Project Title/Research Title: Study on the cryptogams in ex situ growth chamber: A step towards their conservation
- b. Sub area: Plant Biology
 - c. Area Description: Plant Molecular biology, Plant Biochemistry
 - d. Aims & Objective (in Bullets):
 - Botanical curiosity may be solved by studying different cryptogamous plants in non-tropical and less humid region
 - It a cost effective way of growing cryptogamous plants.
 - Less space is required from the system that can be placed in less area.
 - The system is maintenance free and run by solar energy so no extra electricity needed.
 - The water used in this system is the rain water harvested from the roof solar panel and therefore no extra water required for the system.
 - e. Duration (MM/YYYY): 6 month (03/2023)
 - f. Project Summary (1000 words):
- g. Hilly regions of West Bengal are rich source of rare, endangered and medicinal plants (Chhetri 2005). Some plants have ability to survive a new region likes plain areas. They can reproduce in the region (Beniston 2003). The physiological process of these plants may change in different areas. (González *et al.* 2006, Calfapietra *et al* 2015). Different types of cryptogams (e.g. *Lycopodium* sp, *Sphagnum* sp, *Pogonatum* sp, *Selaginella* sp) are used as laboratory specimens and can also be grown in the system. An *in vitro* model has been developed to grow different plants grown in hilly regions of West Bengal. These cryptogamous plants wants low temperature and high moisture content. Light is also an important factor for growth and development of these plants. A system should be design in such way that can provide low temperature and high moisture. The source of light should be arranged in such a way that does not increase temperature of the system. Different biochemical and molecular study will be done to determine the mode of development of the plants in the system. Genetic fidelity also will be tested to

determine any genetic changes or mutation occurs or not. Anatomical and morphological study will be done to understand the change of physical structure. This work is aimed to study and conserve plants inside a low cost artificial growth chamber.

h. **Technical Details**

- a. TRL
- b. Methodology
The plants grown in the system will be collected and a study will be done to find their morphology, biochemical activity and genetic fidelity.
Estimation of Photosynthetic pigment.
Estimation of Dry weight.
Testing of genetic fidelity.
Microscopic observation of plants.
- c. Design & development
- d. Facilities and Instrumentation required:
 - Gel electrophoresis,
 - Gel doc machine,
 - Incubator,
 - UV-Vis Spectrophotometer.
- e. Consumables (Scientific materials) :
Chemicals required for the Biochemical and Molecular experiments.

i. **Expected output and outcome**

j. **Industry/Institute Collaboration**

If, yes

- (i) Name of the Collaborating Institute : Haldia Institute of Technology
- (ii) Collaboration Details: Department of Biotechnology will provide the facility to do the testing of the plants.
- (iii) Additional Details if any: The Author have developed the prototype of the system and filed for the patent. (Application No: 202231019824) .



Fig: Plants growing in the *in vitro* system

k. Funding required from I-STEM (with justification:

Details of Requirements & Mode of the Engagement: (Attach the quotation for the consumables)

(i) Short term Engagement:

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

i. Testing Charges

Plant sample for SEM testing (in IIT KGP)	6,000
Test for Protein and Carbohydrate (HIT, Haldia)	5,000
DNA fidelity test of plants samples (HIT, Haldia)	15,000
Estimation of Photosynthetic pigment Content (HIT, Haldia)	1,000

ii. Consumable charges

Sl. No	Experiment	Chemicals	Price
1	DNA isolation	DNA isolation kit	16000
2	RNA isolation	RNA isolation kit	9000
3	RAPD	Primer	12,000
4	SEM sample Preparation	Glutaraldehyde, Osmium tetroxide, Ethanol	5,000

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

Travel cost for collecting sample	35,000
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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 : AVEEK SAMANTA

PAN:EXMPS5231L

Bank Account No: 20014563516

Name of the Branch: MAHISHADAL

IFSC Code: SBIN0001298

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.