

No. BT/PR40047/NER/95/1662/2020

GOVERNMENT OF INDIA
MINISTRY OF SCIENCE & TECHNOLOGY
DEPARTMENT OF BIOTECHNOLOGY

Block 2, 6-8th Floors
CGO Complex, Lodhi Road,
New Delhi- 110 003
Dated: / /

ORDER

Sanction of the President is hereby accorded, under Rule 18 of the Delegation of Financial Powers Rules ,1978 , for the implementation of the project entitled: "**Harnessing Endophytes and Arbuscular Mycorrhizal Fungi from Citrus Microbiome for Plant and Soil Health Management in North East India**" for a period of 3 Year 0 Month at a total cost of Rs. **11335464** (Rupees One Crores Thirteen Lakhs Thirty Five Thousand Four Hundred and Sixty Four Only) on the terms and conditions detailed here under:-

2 The Project :

2.1 Title : "Harnessing Endophytes and Arbuscular Mycorrhizal Fungi from Citrus Microbiome for Plant and Soil Health Management in North East India"

2.2 Details of the Investigators:

Project Cordinator

Dr. Anjuma Gayan

Assistant Professor

Soil Science

Asaam Agricultural University

College of Sericulture, Soil Science department,

Assam Agricultural University, Jorhat-13, Jorhat, Assam, 785013

Principal Investigators:

Dr. Anjuma Gayan

Assistant Professor

Soil Science

Asaam Agricultural University

College of Sericulture, Soil Science

department,

Dr. Arun Kumar Rai

Assistant Professor

Botany

Sikkim University

Department of Botany, Sikkim

University (Central University),

Dr. Kiran Sunar

Assistant Professor

Botany

Balurghat Mahila Mahavidyalaya

Balurghat Mahila Mahavidyalaya

(Govt. aided college), Balurghat,

Dr. Nirmali Gogoi

Assistant Professor

Environmental Science

Tezpur University

Department of Environmental

Science Tezpur University

CO-PI:**Dr. Dhruba Jyoti Nath**

Principal Scientist

Soil Science

Assam Agricultural University

Department of Soil Science

Assam Agricultural University

Jorhat, Jorhat - 785013, Assam

Mr. Himadri Shekhar Datta

Assistant Professor

Horticulture

Assam Agricultural University

College of Horticulture

Assam Agricultural University

Jorhat, Jorhat - 785013, Assam

2.3 Objectives:**Overall Objectives:**

1. Isolation, characterization and identification of endophytes (bacterial and fungal), Arbuscular Mycorrhizal Fungi (AMF) and plant growth promoting rhizobacteria (PGPR) from Citrus microbiome of NE region of India including Sikkim.
2. Elucidation of the mechanisms involved in growth promotion and disease suppression by endophytes, AM fungi and PGPR.
3. Development of a cost-effective microbial consortia of selected potential endophytes AM fungi and PGPR.
4. Validation of the potential microbial consortia in plant and soil health management of commercial citrus varieties.

Institute wise Objectives:**Assam Agricultural University**

1. Isolation, characterization and identification of endophytes (bacterial and fungal), Arbuscular Mycorrhizal Fungi (AMF) and plant growth promoting rhizobacteria (PGPR) from Citrus limon and Citrus reticulata of NE region of India
2. Elucidation of the mechanisms involved in growth promotion by endophytes (bacteria and fungi), AM fungi and PGPR
3. Development of a cost-effective microbial consortium of selected endophytes (bacterial and fungal), AM fungi and PGPR
4. Validation of the potential microbial consortia in plant and soil health management of Citrus limon and Citrus reticulata

Balurghat Mahila Mahavidyalaya

1. Isolation, characterization and identification of endophytes (bacterial and fungal), Arbuscular Mycorrhizal Fungi (AMF) and PGPR associated with the roots of Citrus reticulata from the major orchards of Sikkim
2. Raising monospore (single spore) cultures of dominant AMF isolates and their morphological characterization and multiplication, alongwith In vitro functional characterization of PGPR of Citrus reticulata
3. Development of cost-effective microbial consortia of potential endophytes, AM fungi and PGPR
4. Validation of potential microbial consortia in plant and soil health management of Citrus reticulata

Details of the Isolation, Characterization and Identification of Endophytes (bacterial and fungal) and Arbuscular Mycorrhizal Fungi (AMF) from PGPR of Citrus Microbiome for Plant and Soil Health Management in North East India's states of Sikkim

Sikkim University			
SNo.	Name of Equipment	No.	Cost (Rs.)
1.	Mini Glass house for plants with exhaust fan and coolers (dimension 15' x15' x15')	1	299720.00
2.	Hot air oven (Digital controller) size 18" x18" x18"	1	29937.00
3.	Cooling centrifuge with voltage stabilizer	1	410340.00
4.	Trinocular Microscope with HD camera	1	236708.00
Total			976705.00
Balurghat Mahila Mahavidyalaya			
SNo.	Name of Equipment	No.	Cost (Rs.)
1.	Small Scale glass house for plants with exhaust fan and coolers (dimension 10' x10' x10')	1	135700.00
2.	Cooling centrifuge with voltage stabilizer	1	410340.00
3.	Trinocular Microscope with HD camera	1	236708.00
4.	Biological safety cabinet (as per class II) Working size- 3x2x2 fit)	1	122531.00
Total			905279.00

The total cost of the project is Rs. **11335464/-** (Rupees One Crores Thirteen Lakhs Hundred and Sixty Four Only) as per details given below :

SNo.	Name of Equipment	Year I	Year II	Year III	Total Cost (Rs.)	Cost (Rs.)
1.	Plant Growth Chamber	1351760	826760	778600	2957120	525000.00
Total						525000.00
2.	Balurghat Mahila Mahavidyalaya	1632039	726760	728600	3087399	
3.	Sikkim University	1703465	726760	778600	3208825	
4.	Tezpur University	676760	726760	678600	2082120	
Total (Rs.)		5364024	3007040	2964400	11335464	

(Dr. Vaishali Panjabi)
Scientist 'E'

Institute wise details are:

Budget Head	Year I	Year II	Year III	Total (Rs.)
5. Sikkim University				
Equipment	976705.00			976705.00
Manpower	401760.00	401760.00	453600.00	1257120.00
Overhead	50000.00	50000.00	50000.00	150000.00
Travel	50000.00	50000.00	50000.00	150000.00
Consumables	150000.00	150000.00	150000.00	450000.00
Contingency	50000.00	50000.00	50000.00	150000.00

Miscellaneous	25000.00	25000.00	25000.00	75000.00
Total (Rs.)	1703465.00	726760.00	778600.00	3208825.00
6. Balurghat Mahila Mahavidyalaya				
Equipment	905279.00			905279.00
Manpower	401760.00	401760.00	453600.00	1257120.00
Overhead	50000.00	50000.00	50000.00	150000.00
Travel	50000.00	50000.00	50000.00	150000.00
Consumables	150000.00	150000.00	100000.00	400000.00
Contingency	50000.00	50000.00	50000.00	150000.00
Miscellaneous	25000.00	25000.00	25000.00	75000.00
Total (Rs.)	1632039.00	726760.00	728600.00	3087399.00
7. Asaam Agricultural University				
Equipment	525000.00			525000.00
Manpower	401760.00	401760.00	453600.00	1257120.00
Consumables	250000.00	300000.00	150000.00	700000.00
Contingency	50000.00	50000.00	50000.00	150000.00
Overhead	50000.00	50000.00	50000.00	150000.00
Travel	50000.00		50000.00	100000.00
Miscellaneous	25000.00	25000.00	25000.00	75000.00
Total (Rs.)	1351760.00	826760.00	778600.00	2957120.00
8. Tezpur University				
Manpower	401760.00	401760.00	453600.00	1257120.00
Consumables	100000.00	150000.00	100000.00	350000.00
Contingency	50000.00	50000.00	50000.00	150000.00
Overhead	50000.00	50000.00	50000.00	150000.00
Travel	50000.00	50000.00		100000.00
Miscellaneous	25000.00	25000.00	25000.00	75000.00
Total (Rs.)	676760.00	726760.00	678600.00	2082120.00

2.6 Equipment:

The details of the equipment sanctioned for the implementation of the project at **Annexure-I**

2.7 Manpower:

The details of the manpower sanctioned for the implementation of the project at **Annexure-II**

3. Head of Account:

The **Non-Recurring** expenditure involved is debitable to:

Demand No. 88	Department of Biotechnology
3425	Other Scientific Research 2020-2021
3425.60	Others (Sub Major Head)
3425.60.200	Assistance to other Scientific Bodies (Minor Head)
3425.60.200.29	Biotechnology Research and Development
3425.60.200.29.17	Assistance for Research and Development
3425.60.200.29.17.35	Grants for creation of capital assets

The **Recurring** expenditure involved is debitable to:

Demand No. 88	Department of Biotechnology
3425	Other Scientific Research 2020-2021
3425.60	Others (Sub Major Head)
3425.60.200	Assistance to other Scientific Bodies (Minor Head)
3425.60.200.29	Biotechnology Research and Development
3425.60.200.29.17	Assistance for Research and Development
3425.60.200.29.17.31	Grants -in-Aid General

4. Terms & Conditions:

Additional Terms and Conditions, specific for Twinning R and D program for NER

a. Both NER and Rest of India (RoI), Institutions scientists should work together for the objectives stated in the sanction of the project and any deviation from this would attract closure of the project at any point of time.

b. In the project review meetings, both the PIs from NER and RoI Institutions should participate and make presentation.

c. The outcomes of the project such as research papers, patents, copy rights etc. should be made jointly.

d. The NER Scientists are to be trained at the collaborating institute appropriately to empower the NER Scientists.

e. The project personal such as Research Associate, JRF or SRF, Research Assistant are also to be trained at least once in the collaborating national institute.

f. The collaborating institute scientist should visit NER institutions more frequently to guide NER scientists in design and conduct of experiments.

g. The Non-Recurring items must be procured and installed within 18-months of the sanction of the project, failing which the PIs have to return the remaining/unutilized Non Recurring grant with 10% of Interest.

h. In case the amount of grant-in-aid is refunded, the whole or a part amount of the grant, with an interest at 10% per annum there on shall be recovered.

Additional Terms and Conditions, specific for Twinning R and D program for NER

a. Both NER and Rest of India (RoI), Institutions scientists should work together for the objectives stated in the sanction of the project and any deviation from this would attract closure of the project at any point of time.

b. In the project review meetings, both the PIs from NER and RoI Institutions should participate and make presentation.

c. The outcomes of the project such as research papers, patents, copy rights etc. should be made jointly.

d. The NER Scientists are to be trained at the collaborating institute appropriately to empower the NER Scientists.

e. The project personal such as Research Associate, JRF or SRF, Research Assistant are also to be trained at least once in the collaborating national institute.

f. The collaborating institute scientist should visit NER institutions more frequently to guide NER scientists in design and conduct of experiments.

g. The Non-Recurring items must be procured and installed within 18-months of the sanction of the project, failing which the PIs have to return the remaining/unutilized Non Recurring grant with 10% of Interest.

h. In case the amount of grant-in-aid is refunded, the whole or a part amount of the grant, with an interest at 10% per annum there on shall be recovered.

4.1 The other terms and conditions governing this sanction are attached at Annexure- III.

- 4.2A** Memorandum of Agreement (MoA) will be signed between the Department of Biotechnology and the grantee institution on Non-Judicial stamp paper Rs. 100/- in the enclosed format and the second release/installment will be made only after signing of MoA between the grantee institutions and DBT. In case of NGO's and Private Institution's, execution of MOA is mandatory before first release. A format of the MoA is enclosed in Annexure-IV
- 4.3** The Institute/Agency will keep the whole of the grant in a Bank Account earning interest, and the interest so earned should be reported to DBT in the Utilisation Certificate and Statement of Expenditure. The Interest so earned will be treated as created to the institute/Agency and shall be adjusted towards further installment of the grant and or at the time of Final Settlement of Accounts.
- 5.** No International Travel will be undertaken from the sanctioned project grant unless specified otherwise.
- 6.** The Director, Asaam Agricultural University, Jorhat, Assam and The Dr Biman Chakraborty, Balurghat Mahila Mahavidyalaya, Malda, West Bengal and The Registrar, Sikkim University, Gangtok, Sikkim and The Registrar, Tezpur University, Tezpur, Assam would be responsible for submission of Statements of Expenditure (SoE), utilization certificates (UC), Assets Certificates, Manpower staffing & expenditure details in prescribed DBT formats to DBT in respect of grants released in this project from time to time.
- 7.** PI's of DBT sponsored projects can consider appointment of JRF from Category-II merit list of DBT-BET exam so that candidates can be paid fellowships at par with NET/GATE/BET qualified candidates as per DST OM No. A.SR/S9/Z-05/2019 dated on 30 Jan 2019. However, there is no compulsion on PI's to select candidates for JRF in their projects from Category-II of DBT-BET.
- 8.** As per Rule 236 (1) of GFR 2017, the accounts of all Grantee Institutions or Organisations shall be open to inspection by the sanctioning authority and audit, both by the Comptroller and Auditor General of India under the provision of CAG(DPC) Act 1971 and internal audit by the Principal Accounts Office of the Ministry or Department, whenever the Institution or Organisation is called upon to do so.
- 9.** If the Research Project involves biological resources, the obligations under the Biological Diversity Act 2002 as applicable shall be complied with by the Project Investigator, the details of such obligations can be accessed at www.nbaindia.org
- 10.** If this project works requires any Statutory Clearance (such as Ethical Committee Clearance, Informed Consent, Animal Ethics Committee Clearance, Institutional Bio-safety Committee Clearance, National Biodiversity Authority approval etc.), Project investigator(s) and Host Institution(s) shall compulsory comply the same before undertaking such activities.
- 11.** This issues under the power delegated to this Department and with the concurrence of IFD vide their SAN No. **102/IFD/SAN/2350/2020-2021** dated **February, 09 2021**.
- 12.** This sanction order has been noted at serial no. _____ in the Register of Grants.

(Dr. Vaishali Panjabi)
Scientist 'E'

To,
The Pay & Accounts Officer,
Department of Biotechnology,
New Delhi – 110 003.

Copy to:

- 1 The Principal Director of Audit (Scientific Departments), DACR Building, New Delhi- 110 002.
- 2 Dr. Anjuma Gayan(Project Co-ordinator), College of Sericulture,Assam Agricultural University,Jorhat:785013, Assam
- 3 The Director, Asaam Agricultural University, Assam Agricultural University Jorhat-785013
Assam, Jorhat - 785013, Assam
- 4 The Dr Biman Chakraborty, Balurghat Mahila Mahavidyalaya, Balurghat, Dakshin Dinajpur, West Bengal, Malda - 733101, West Bengal
- 5 The Registrar, Sikkim University, 6TH MILE, SAMDUR,P. O. : TADONG GANGTOK, SIKKIM, Gangtok - 737102, Sikkim
- 6 The Registrar, Tezpur University, Tezpur University Napaam, Tezpur
Sonitpur, Tezpur - 784028, Assam
- 7 Dr. Anjuma Gayan, Assistant Professor, Soil Science, Asaam Agricultural University, College of Sericulture,Soil Science department,
Assam Agricultural University,Jorhat-13, Jorhat - 785013, Assam
- 8 Dr. Arun Kumar Rai, Assistant Professor, Botany, Sikkim University, Department of Botany, Sikkim University (Central University), 6th mile, Samdur, P.O.Tadong,Gangtok,Sikkim, Gangtok - 737102, Sikkim
- 9 Dr. Dhruva Jyoti Nath, Principal Scientist, Soil Science, Assam Agricultural University, Department of Soil Science
Assam Agricultural University
Jorhat, Jorhat - 785013, Assam
- 10 Dr. Kiran Sunar, Assistant Professor, Botany, Balurghat Mahila Mahavidyalaya, Balurghat Mahila Mahavidyalaya (Govt. aided college), Balurghat, P.O.Balurghat, District: Dakshin Dinajpur, West Bengal, 733101, Islampur West Bangal - 733101, West Bengal
- 11 Dr. Nirmali Gogoi, Assistant Professor, Environmental Science, Tezpur University, Department of Environmental Science Tezpur University
Napaam, Tezpur District: Sonitpur, Assam, Tezpur - 784028, Assam
- 12 Mr. Himadri Shekhar Datta, Assistant Professor, Horticulture, Asaam Agricultural University, College of Horticulture
Assam Agricultural University
Jorhat, Jorhat - 785013, Assam
- 13 Cash Section, DBT (2 copies).
- 14 Sanction Folder.
- 15 File Copy.

(Dr. Vaishali Panjabi)
Scientist 'E'

Annexure -II

Details of the manpower sanctioned for the implementation of the project entitled "**Harnessing Endophytes and Arbuscular Mycorrhizal Fungi from Citrus Microbiome for Plant and Soil Health Management in North East India**":

Head	No. of Position	Year I	Year II	Year III	Total (Rs.)
5. Asaam Agricultural University					
Junior Research Fellow To carry out laboratory and field works	1	401760	401760	453600	1257120
Total(Rs.)		401760	401760	453600	1257120
6. Balurghat Mahila Mahavidyalaya					
Junior Research Fellow Working with AMF and PGPR related laboratory and field works	1	401760	401760	0	803520
Senior Research Fellow Working with AMF and PGPR related laboratory and field works	1	0	0	453600	453600
Total(Rs.)		401760	401760	453600	1257120
7. Sikkim University					
Junior Research Fellow Working with Endophytes (bacteria and fungi) and PGPR related laboratory and field works	1	401760	401760	0	803520
Senior Research Fellow Working with Endophytes (bacteria and fungi) and PGPR related laboratory and field works	1	0	0	453600	453600
Total(Rs.)		401760	401760	453600	1257120
8. Tezpur University					
Junior Research Fellow To carry out laboratory and field works	1	401760	401760	0	803520
Senior Research Fellow To carry out laboratory and field works	1	0	0	453600	453600
Total(Rs.)		401760	401760	453600	1257120

Emoluments detail of research personal(s) mentioned in table(s) of Annexure-II shall be applicable only if candidate(s) met educational qualification and eligibility criteria as per DST

OM No. SR/S9/Z-05/2019 dated 10.07.2020.

(Dr. Vaishali Panjabi)
Scientist 'E'