From: Principal & Secretary
+91 3213 255282
saratcentenary@gmail.com
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Dhaniakhali, Hooghly, 712302

Sarat Centenary College

Dhaniakhali, Hooghly

Founded: 1976
Recognised Under UGC 2F&12B
WB Govt. Aided
Affiliated to The University of Burdwan

3RD CYCLE NAAC ACCREDITATION PROCESS-2024

CRITERIA: 3 RESEARCH, INNOVATIONS AND EXTENSION

Key Indicator: 3.5 Collaboration

Metric: 3.5.1- Number of functional MoUs/linkages with institutions/ industries in India and abroad for internship, on-the-job training, project work, student / faculty exchange and collaborative research during the last five years.

*** Document of Collaborative Research between Sarat Centenary College and Department of Bio-Technology (Govt. of India)**

SARAT CENTENARY COLLEGE * DHANIAKHALI * Estd. 1976 HOOGHLY

[DR SANDIP KUMAR BASAK]
Principal, Sarat Centenary College
Principal & Secretary,
Sarat Centenary College
P.O.- Dhaniakhali, Dist.- Hooghly

BT/PR39375/FCB/125/51/2020
Government of India
Ministry of Science & Technology
Department of Biotechnology

Block 2, 7th Floor
CGO Complex, Lodhi Road
New Delhi 110 003
Dated: 12th May, 2022

Addendum

In continuation of this departments' sanction order of even no. dated 17th March, 2022 of the project entitled **"Development of Biological Control Technology for invasive species Polyalthia suberosa Hamjam in wild life Sanctuary of Bethuadahari West Bengal"** being implemented at West Bengal State University, Kolkata, West Bengal, The name of Co-Investigators are included as per following details-

S.N.	Details
1.	Dr. Sandip Kumar Basak, Sarat Centenary College (Affiliated to the University of Burdwan, West Bengal) Dhaniakhali, Hooghly, West Bengal
2.	Dr. Arup Kumar Mitra, St. Xavier's College(Autonomous) Kolkata (affiliated to the University of Calcutta)
3.	Mr. Rana Datta, Deputy Conservator of Forests & Divisional Forest Officer, Nadia Murshidabad Division, Directorate of Forests, Govt of West Bengal

2. The other terms and conditions of the project as given in the Department's sanction order of dated 17th March, 2022 will remain unchanged.

(Dr. Balendra Singh)
Scientist 'C'

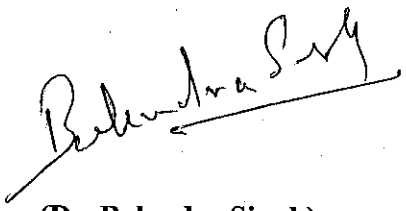
To,

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. The Registrar, West Bengal State University, Barasat, Berunanpukuria, Malikapur, North 24 Praganas, Kolkata - 700126, West Bengal
3. Dr. Krishna Ray, Assistant Professor, Botany, West Bengal State University Berunanpukuria, Malikapur, BarasatWest Bengal, Kolkata - 700126, West Bengal

4. Dr. Sandip Kumar Basak, Sarat Centenary College (Affiliated to the University of Burdwan, West Bengal) Dhaniakhali, Hooghly, West Bengal
5. Dr. Arup Kumar Mitra, St. Xavier's College (Autonomous) Kolkata (affiliated to the University of Calcutta
6. Mr. RanaDatta, Deputy Conservator of Forests & Divisional Forest Officer, Nadia Murshidabad Division,
7. Directorate of Forests, Govt of West Bengal
8. Cash Section, DBT (2 copies).
9. Sanction Folder.
10. File Copy



(Dr. Balendra Singh)
Scientist 'C'

No. BT/PR39375/FCB/125/51/2020
GOVERNMENT OF INDIA
MINISTRY OF SCIENCE & TECHNOLOGY
DEPARTMENT OF BIOTECHNOLOGY

Block 2, 6-8th Floors
CGO Complex, Lodhi Road,
New Delhi- 110 003
Dated:17/03/2022

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 "**Development of Biological Control Technology for invasive species, Polyalthiasuberosa, Hamjam, in Wild Life Sanctuary of Bethuadahari, West Bengal**" for a period of 3 Year 0 Month at a total cost of Rs.**3983360** (Rupees Thirty Nine Lakhs Eighty Three Thousand Three Hundred and Sixty Only) on the terms and conditions detailed here under:-

2 The Project :

2.1 Title : Development of Biological Control Technology for invasive species, Polyalthiasuberosa, Hamjam, in Wild Life Sanctuary of Bethuadahari, West Bengal

2.2 Details of the Investigators:

Dr. Krishna Ray
Assistant Professor
Department of Botany
West Bengal State University
Berunanpukuria, Malikapur, Barasat, Kolkata, West Bengal, 700126

2.3 Objectives:

1. Study of invasion mechanisms of the invasive species Polyalthiasuberosa (commonly called "Hamjam") in the Wild Life Sanctuary of Bethuadahari
2. Detection and isolation of any fungal/rhizobacterial pathogen of "Hamjam" showing lethal disease/growth suppression solely specific to the invader species and native to the Wild Life Sanctuary
3. Optimization of the field application of the bio-control agent/agents in model plot of 5 acres in the "Hamjam" infested area of the sanctuary

2.4 Time Schedule:

The duration of the project is 3 Year 0 Month from the date of this sanction order.

2.5 Project Cost:

The total cost of the project is Rs. **3983360**/-(Rupees Thirty Nine Lakhs Eighty Three Thousand Three Hundred and Sixty Only) as per details given below:

Budget Head	Year I	Year II	Year III	**Total**(Rs.)
Equipment	1780000.00			**1780000.00**
Manpower	922560.00	0.00	520800.00	**1443360.00**
Overhead	20000.00	20000.00	20000.00	**60000.00**
Travel	20000.00	20000.00	20000.00	**60000.00**
Consumables	180000.00	180000.00	180000.00	**540000.00**
Contingency	40000.00	30000.00	30000.00	**100000.00**
Total (Rs.)	**2962560.00**	**250000.00**	**770800.00**	**3983360.00**

BALENDRA SINGH
Scientist 'C'
Department of Biotechnology
Govt. of India
C.G.O. Complex, Lodhi Road
New Delhi-110003

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. 89	**Department of Biotechnology**
3425	Other Scientific Research 2021-2022
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 to Research and Development
3425.60.200.29.17.35	Grants for creation of capital assets

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

Demand No. 89	**Department of Biotechnology**
3425	Other Scientific Research 2021-2022
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 to Research and Development
3425.60.200.29.17.31	Grants -in-Aid General

4. Terms & Conditions:

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

4.2 A 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 earned should be remitted to the Consolidated fund of India through Bharat Koshportal(www.bharatkosh.gov.in) as per GFR-2017-230(8) after finalization of the account for a given Financial Year.

5. No International Travel will be undertaken from the sanctioned project grant unless specified otherwise.

6. The Registrar, West Bengal State University, Kolkata, West Bengal 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 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 Organizations 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 Organizations is called upon to do so.

9. The equipment /instrument shall have to be purchased within eighteen(18) months from the date of release of the capital grant for a particular year. Fresh permission shall have to be sought from DBT in the event the organization fails to purchase the equipment/instrument within the prescribed period of eighteen (18) months from the date of release of sanctioned amount

10. It is mandatory to acknowledge financial support provided by DBT in bold letters via inclusion of Grant reference number, Name of the Department (i.e. DBT) and the duration of the financial support including the dates in acknowledgement section of publications/patents/technology transfer documents/media communications/press announcements/exhibitions and other such events, vide notification no. DBT/PCAH/Gen/01 dated 07.06.2012 during and after the completion of the project

11. It is obligatory to assess/observe the biosafety compliance for rDNA activities to be performed by grantee organization(s) and investigators for the proposals submitted to DBT for financial support as per the notification vide no. BT/BS/17/459/2011-PID dated 26.09.2012

12. Medical allowance will not be paid with Manpower salary, as medical benefits are not part of salary component. The research fellows (JRF/SRF/Research Associate)will be entitled for Medical allowance from the implementing Institutions as applicable

13. 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

14 (I) "The PIs/Implementing Agencies shall strictly adhere to the GoI instructions issued vide OM No.F.4.1.2021-PPD dated 30.6.2021 in the matter of issue of Global tender Enquiry with special reference to instructions contained under para 4 of the said OM for procurement of equipments, spares and consumables for research purposes and shall not issue Global Tenders Enquiries before seeking the approval of the competent authority".

(II) "After incurring the expenditure on import of such items and at the time of submission of UCs to the department next year, the PIs will also furnish the copy of the approval sought from the competent authority for issue of the GTE for such items of import. The release of next installment of grant will the subject to the fulfillment of the above condition."

15. If this project works requires any Statutory Clearance (such as Ethical Committee Clearance, Informed Consent, Animal Ethics Committee Clarence, 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

16 Continuation of the project beyond 31.3.2021 will be subject to appraisal and approval of the DBT umbrella scheme on "Biotechnology Research and Development" for continuation beyond 14th FCC

17. As per Ministry of Finance OM.NO.C-13015(34)MF CGA/PFMS/Misc/2014-15/2095-2127 dated 03.03.2015 all transaction involving cash component has to be made through Public Financial Management System (PFMS) w.e.f 01.04.2015 to each beneficiaries.

18. As per Rule 236 (1) of GFR 2017, the accounts of all Grantee Institutions or Organizations 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 Organizations is called upon to do so.

19. The expenditure by the implementing agency is to be incurred only through the EAT module of PFMS.

20 This issues, under the power delegated to this Department and with the concurrence of IFD vide their SAN No.**102/IFD/SAN/3425/2021-22** dated **17/032022**

21. This sanction order has been noted at serial no. 27 in the Register of Grants

Balendra Singh

(Dr. Balendra Singh)
Scientist 'C'
BALENDRA SINGH
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Department of Biotechnology
Govt. of India
C.G.O. Complex, Lodhi Road
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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 The Registrar, West Bengal State University, Barasat,Berunanpukuria,Malikapur, North 24 Praganas, Kolkata - 700126, West Bengal
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(Dr. Balendra Singh)
Scientist 'C'

Annexure -I

Details of the Equipment sanctioned for the implementation of the project entitled **"Development of Biological Control Technology for invasive species, Polyalthiasuberosa, Hamjam, in Wild Life Sanctuary of Bethuadahari, West Bengal":**

West Bengal State University			
SNo.	**Name of Equipment**	**No.**	**Cost(Rs.)**
1.	-86°C Freezer, Model: U410-86	1	650000.00
2.	UPRIGHT TRINOCULAR RESEARCH MICROSCOPE WITH IN-BUILT HD RESOLUTION 9" LCD SCREEN AND DEDICATED CAMERA ATTACHMENT	1	380000.00
3.	Laminar Flow Clean Air Work Station (Horizontal)	1	250000.00
4.	Culture Room facility	1	500000.00
		Total	**1780000.00**

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Annexure -II

Details of the manpower sanctioned for the implementation of the project entitled **"Development of Biological Control Technology for invasive species, Polyalthiasuberosa, Hamjam, in Wild Life Sanctuary of Bethuadahari, West Bengal":**

Head	**No. of Position**	**Year I**	**Year II**	**Year III**	**Total** (Rs.)
Junior Research Fellow Year 1 & 2 Rs.31000/-p.m +24%HRA	1	461280	461280	0	**922560**
Senior Research Officer Rs.35000/-+24%HRA	1	0	0	520800	**520800**
Total(Rs.)		**461280**	**461280**	**520800**	**1443360**

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Annexure-III

Quarterly Deliverables of the project:-

	Quarterly Deliverables of the project	**Time line**
1.	1. Advt. publication 2. Staff recruitment 3. Initiation of Purchase and procurement process of instruments 4. Survey for exclusive disease or growth suppression symptoms in WLS, Bethuadahari	Q1[0-3 Months]
2.	1. Quadrat study in WLS to prove dominance of invasive species referred 2. Seed output, viability, dispersal, entire life cycle of invader study 3. Invader seed germination, seedling maintenance optimization under control culture room 4. Start of causal organism isolation and pure culture establishment associated with disease symptom and growth suppression phenotype exclusively observed for the invasive species	Q2
3.	1.molecular identification of disease causing/growth suppressing causal organisms by ribosomal RNA gene sequencing (18SrRNA/ITS/16SrRNA) 2.Start of Rhizospheric microbial population (AMF, mutualistic bacterial population) isolation from rhizosphere of invader and native species 3. Seed collection from native/invader species and optimization of seedling growth under control culture room	Q3
4.	Allelopathic effect of invader if any to be proved by 1.Impact of leaf leachates/root-exudates/ rhizospheric soil/rhizospheric soil microbes of the invader species on seed germination and growth of other native species of the sanctuary under control culture room 2.Assay of probable presence of any allelochemical like catechin, L-tryptophan, methyl jasmonate etc. through HPLC analyses in the root exudates/leaf leachate/rhizospheric soil extract of the invader. HPLC optimization may take some more time	Q4
5.	1.Conclusion to be drawn on role of "Hamjam" leaf litter/root exudate on resident plant population (both field and laboratory studies) 2.Conclusion to be drawn on role of rhizospheric microbial population on native plant population(both field and laboratory studies) 3. Start of assay of growth suppression by rhiozobacteria established in pure culture to be screened for growth negating parameters. 4. Start of host range specificity studies of the pathogenic fungus under control culture room condition	Q5
6.	1.Assay of growth suppression of rhiozobacteria continued. 2 Host range specificity studies of the pathogenic fungus continued. 3. Growth effect studies to confirm the specificity of growth suppression to be exclusively associated with the invasive species under control condition. 4. Comparative study for efficiency of control of invasive species by fungal pathogen/deleterious rhizobacteria under controlled condition.	Q6
7.	1. Assay of growth suppression of rhiozobacteria continued. 2 Host range specificity studies of the pathogenic fungus continued. 3. Continued growth effect studies to confirm the specificity of growth suppression to be exclusively associated with the invasive species under control condition. 4. Continued comparative study for efficiency of control of invasive species by fungal pathogen/deleterious rhizobacteria under controlled condition	Q7

8.	1. Conclusion on invasion mechanism 2. Conclusion on host range specificity and control efficiency of pathogenic fungus on invasive species 3. Conclusion on host range specificity and control efficiency of deleterious rhizobacteria, if any on invasive species 4. Comparative statement on efficiency of control and host specificity among fungal pathogen/ growth inhibiting rhizobacteria on invasive species	Q8
9.	1. Continuation of host range specificity studies, if unfinished yet 2 Optimization of large scale development of spore suspension/bacterial culture asinocula for application to the field. 3. Optimization of the appropriate time of application in field.	Q9
10.	1. Ideal plot selection in WLS for field application 2. Approximate stage of plant to be chosen 3. Selection of untreated control plots for comparison 4. Appropriate dose of biocontrol agent decided for field application 5. Field application initiated	Q10
11.	Monitoring the effect of application of the developed bio-control agent in model plots infested with the invasive species in terms of growth, mortality and spread,throughout several seasons under different climatic conditions keeping untreated control plots for comparison	Q11
12.	1.Monitoring the effect of application of the developed bio-control agent in model plots continued 2. Monitoring the effect of single application and multiple applications of biocontrolagent/agents. 3. Monitoring the effect separately or in a synergistic manner. 4. Recovery of the inoculated pathogen, persistence of inoculated pathogen, intensity of infection/association in field on invasive species population. 5. Measuring control efficiency of biocontrol agent applied, right from the field. 6. Estimation of re-emergence frequency of the invasive species after initial field application	Q12

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