File No.: **BT/PR45917/BCE/8/1695/2022**

GOVERNMENT OF INDIA
MINISTRY OF SCIENCE & TECHNOLOGY
DEPARTMENT OF BIOTECHNOLOGY

Block 2, 6-8th Floors
CGO Complex, Lodhi Road,
New Delhi- 110003
Dated: 31/05 / 2024

ADMINISTRATIVE 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 "**Technology Development and Bioprocess Engineering of Agro-Industrial and Single use Polyethylene waste to biodegradable Polyhydroxyalkanoates by Halophilic Microorganisms**" for a period of 3 Year 0 Months at a total cost of **Rs. 3884280** (Rupees Thirty Eight Lakhs Eighty Four Thousand Two Hundred and Eighty Only) on the terms and conditions detailed here under: -

2. The Project

2.1 Title: **Technology Development and Bioprocess Engineering of Agro-Industrial and Single use Polyethylene waste to biodegradable Polyhydroxyalkanoates by Halophilic Microorganisms**

2.2. Details of the Investigators:

Project Coordinator/PI:

Dr. Bhakti Balkrishna Salgaonkar
Microbiology, Faculty of Life Sciences & Envt.
Goa University, Goa - 403206

Dr. Judith Maria Braganca
Assistant Professor
Biological Sciences
Birla Institute of Technology & Science, Pilani –Goa

CO-PI

Dr. Diptesh Naik
Assistant professor
School of Chemical Sciences
Goa University ,Goa

2.3. Objectives

Overall Objectives:

- Optimization, Bioprocess Engineering, bulk Synthesis and characterization of the production of the biodegradable plastics [poly hydroxyalkanoates (PHAs)] by halophilic microorganisms using various renewable agro-industrial byproducts.
- Studies on the conversion of the single use polyethylene waste to biodegradable plastics (PHAs) by halophilic microorganisms.

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- Biodegradation and biocompatibility studies of the biopolymer synthesized by Halophilic Microorganisms.

Institute wise Objectives:

Goa University

- Optimization, Bioprocess Engineering, bulk Synthesis and characterization of the production of the biodegradable plastics [poly hydroxyalkanoates (PHAs)] by halophilic microorganisms using various renewable agro-industrial byproducts.
- Studies on the conversion of the single use polyethylene waste to biodegradable plastics (PHAs) by halophilic microorganisms.

Birla Institute of Technology & Science , Pilani - Goa

- Biodegradation and biocompatibility studies of the biopolymer synthesized by Halophilic Microorganisms.

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 The total cost of the project is **Rs. 3884280/-(Rupees Thirty Eight Lakhs Eighty Four Thousand Two Hundred and Eighty Only)** as per details given below:

(Financial figures are shown in Rs.)

Institute	Year I	Year II	Year III	Total Cost (Rs.)
Goa University	1800960.00	743960.00	809360.00	3354280.00
Birla Institute of Technology & Science , Pilani - Goa	110000.00	210000.00	210000.00	530000.00
Total (Rs.)	**1910960.00**	**953960.00**	**1019360.00**	**3884280.00**

Institute wise budget details are:

(Financial figures are shown in Rs.)

Budget Head	Year I	Year II	Year III	Total (Rs.)
	Goa University			
Grants for Creation of Capital Assets	907000.00	--	--	907000.00
Grants-in-aid General	893960.00	743960.00	809360.00	2447280.00
Total	**1800960.00**	**743960.00**	**809360.00**	**3354280.00**
	Birla Institute of Technology & Science , Pilani- Goa			
Grants for Creation of Capital Assets	00.00	--	--	00.00
Grants-in-aid General	110000.00	210000.00	210000.00	530000.00
Total	110000.00	210000.00	210000.00	530000.00
Grand Total	**1910960.00**	**953960.00**	**1019360.00**	**3884280.00**

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2.6 Equipment (Capital Assets): The details of the Capital Assets sanctioned for the implementation of the project is detailed at **Annexure-I**

2.7 Institute wise, year-wise "Overhead" budget is restricted to **Rs. 30000.00** each year of **Goa University** & **Rs.10000.00** each year of **Birla Institute of Technology & Science , Pilani-Goa**

3. Head of Account:

The Recurring (GIA General) expenditure involved is debitable to

Demand No. 90	**Department of Biotechnology**
3425	Other Scientific Research 2024-2025
3425.60	Others (Sub Major Head)
3425.60.200	Assistance to other Scientific Bodies
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

The **Non-Recurring (Grants for creation of capital assets)** expenditure involved is debitable to:

Demand No. 90	**Department of Biotechnology**
3425	Other Scientific Research 2024-2025
3425.60	Others (Sub Major Head)
3425.60.200	Assistance to other Scientific Bodies
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 of Creation of Capital Assets

4. Terms & Conditions:

4.1. In case the whole or a part of the amount of the grant-in-aid is being refunded, an interest rate at the rate of ten percent thereon shall be recovered. The equipment sanctioned under the project should be purchased within 18 months from the date of the release of the grant.

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 herewith.

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4.3. In accordance with Rule 238(5) & 238(6) of GFR, 2017, the private institutes/ voluntary organizations which are receiving Grant-in-aid of Rs.50.00 lakh and above have to submit their Annual Reports and Annual Audited Accounts to the Department within 09 months of the close of the succeeding financial year.

4.4. No international travel will be undertaken from the sanctioned project grant unless specified otherwise.

4.5 The Director, Birla Institute of Technology & Science, Pilani - Goa, and The Registrar, Goa University, Goa, Goa would be responsible for submission of Utilization Certificates (UC), Statements of Expenditure (SoE), Capital Assets Acquired Certificates, in prescribed DBT formats to DBT in respect of grants released in this project from time to time. The institute shall also furnish an undertaking that monthly emoluments of engaged human resource in this project have been disbursed in accordance with the duly notified norms/guidelines of the Government Department/Ministry/Autonomous Bodies.

4.6. PI's of DBT sponsored projects can consider appointment of JRF from Category-II merit list of DBT-BET exam so that didates can be paid fellowships at par with NET/GATE/BET qualified candidates as per DST OM No.SR/S9/Z-08/2018 dated 30.01.2019. However, there is no compulsion on PI's to select candidates for JRF in their projects from Category-II of DBT-BET.

4.7 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.

4.8. 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

4.9. "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".

4.10. 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 instalment of grant will the subject to the fulfilment of the above condition."

4.11. If any biological data as specified in the guidelines are being generated in the project then PI should submit the data generated in the project to Indian Biological Data Centre – The National Repository being implemented at Regional Centre for Biotechnology, Faridabad in compliance with the Biotech-PRIDE Guidelines 2021.

4.12. The quarterly deliverables in the project, in quantifiable terms have to be provided for each quarter of the project, based on which, inter-alia, monitoring/review of the project will be done and proposal for release of subsequent instalment will be considered. Please see **Annexure-II.**

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4.13. While asking for 2nd instalment onwards, the Institute has to certify that the Institute has not utilized more than the amount sanctioned under the 'Overhead' component.

4.14. The PI and the Institute will comply with the rules and Guidelines issued by the Department of Biotechnology for competitive research grant system.

5. This issues, under the power delegated to this Department and with the concurrence of IFD vide their **SAN No.102/IFD/SAN/ 770 /2024-25** dated 29th May 2024.

6. This sanction order has been noted at serial no. 20 . in the Register of Grants.

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डॉ. बालेन्द्र सिंह / Dr. Balendra Singh
वैज्ञानिक 'डी' / Scientist 'D'

To,

The Pay & Accounts Officer,
Department of Biotechnology,
New Delhi – 110003

Copy to:

1. The Principal Director of Audit (Scientific Departments), DACR Building, New Delhi-110002.
2. Cash Section, DBT (2 copies).
3. Sanction Folder.
4. File Copy.
5. CNA, NII, New Delhi
6. The Registrar, Goa University, Taleigao Plateau, Goa, Goa - 403206
7. The Director, Birla Institute of Technology & Science, Pilani - Goa, 403726
8. Dr. Bhakti Balkrishna Salgaonkar, (Project Co-ordinator), Microbiology, Faculty of Life Sciences & Envt., Goa University, Goa - 403206
9. Dr. Judith Maria Braganca, Associate Professor, Biological Sciences, Birla Institute of Technology & Science, Pilani - Goa, 403726
10. Dr. Diptesh Gurudas Naik, Assistant Professor, School of Chemical Sciences, Goa University, Goa -403206

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Annexure –I

Details of the Equipment sanctioned for the implementation of the project entitled **"Technology Development and Bioprocess Engineering of Agro-Industrial and Single use Polyethylene waste to biodegradable Polyhydroxyalkanoates by Halophilic Microorganisms":**

(Financial figures are shown in Rs.)

Goa University			
SNo.	**Name of Equipment**	**No.**	**Cost(Rs.)**
1.	Fermentor Bio-RacA 5L-10L	1	907000.00
Total			**907000.00**
Birla Institute of Technology & Science ,Pilani-Goa			
1.	NA		00.00
		Total	**00.00**

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Annexure-II

Details of the Quarterly Deliverables sanctioned for the implementation of the project entitled **"Technology Development and Bioprocess Engineering of Agro-Industrial and Single use Polyethylene waste to biodegradable Polyhydroxyalkanoates by Halophilic Microorganisms":**

Milestone	Deliverable	Quarter
1ST Year	Processing of the field and administrative approvals for the recruitment of the Junior research Fellow (JRF). Literatute review and planning of the experiments.	1-3 Months
	Processing of the field and administrative approvals for the purchase of the equipment under non-recurring budget. Reviving the halophilic cultures. Procurements of the consumables.	4-6 Months
	Optimization of media parameters and conditions for high PHA production by the potential halophilic isolate. Screening for the isolates for the utilization of more lignocellulosic waste substrates.	7-9 Months
	The scale up studies and designing of the fermentor. Data Analysis and report writing. Administrative procedures such as submitting the Utilization certificate (UC) and Statement of Expenditure (SE).	10-12 Months

2nd Year	Extraction and Characterization of the polymer synthesized using lignocellulosic waste substrates. Data Analysis	13-15 Months
	Polyethylene (PE) waste and its byproducts such as oxidized wax will be used as carbon substrates for the production of PHAs	16-18 Months
	The samples of the PE will be checked for its degradation using various physic-chemical methods such as SEM, TGA-DTA, FT-IR	19-21 Months
	Fed-batch process for PHA production will be developed using polyethylene wastes as substrates. Compilation of data simultaneously and filing of process patent or communicating the preliminary data in the form of manuscript to peer-reviewed journals. Data Analysis and report writing. Administrative procedures such as submitting the Utilization certificate (UC) and Statement of Expenditure (SE).	22-24 Months
3rd Year	Procurement of chemicals and other requirements for performing the Biodegradation and biocompatibility studies	25-27 Months
	Preparation of biopolymer film from Co-Polymer synthesised by halophilic microorganisms and its characterization	28-30 Months
	Characterization of the film Biocompatibility studies using cell line (Animal Tissue culture). The *in vitro* degradability of the macroporous films/ scaffolds will be determined	31-33 Months
	Compilation of data and filing of process patent or communicating the preliminary data in the form of manuscript to peer-reviewed journals. Consolidated data Analysis and report writing. Administrative procedures such as submitting the Utilization certificate (UC) and Statement of Expenditure (SE).	34-36 Months

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