Chaitanya Bharathi Institute of Technology
Research and Development Centre
Research and Entrepreneurship Hub

CBIT / R&E Hub / R&D / Students Projects / 09 /dt.28 Apr 2023

28 Apr 2023
Hyderabad

To
The Principal

Sub: Funding of Student Project

The institution completely / partially funds the students projects depending on the importance of the theme / thrust area of the project to encourage research and innovation culture among the student community.

Recently one BE final year student batch submitted application for funding their project work and the same is reviewed. Initially, the presentation is given in presence of the Advisor-R&D and a couple of modifications are suggested. Those suggestions are taken into account in the revised version. After due consideration of the importance and relevance of the project to the aims and objectives of the institution, the following project is recommended with the mentioned funding for further processing. The following are the details.

S. No	Name of the Student	Mentor / Supervisor	Title of the Proposal and proposed budget (Rs)	Date of Presentation	Remarks
1.	Nitin Badhe and K Chetan Babu	Dr.Y Rajasri	Rs.10,000 /-	26 Apr 2023	Recommended
Recommendation		An amount of **Rs. 10,000/-** may be sanctioned			

After completion of the project, the students are advised to give a presentation on the proposed objectives and obtained results/deliverables in the presence of mentors. Also directed to submit a video of a maximum of 5 minutes and a comprehensive report to the undersigned with a copy to the Principal. Any components/subsystems bought under this project will remain with the respective departments. All the accounts related to the sanctioned amount are to be settled with the account section by the students under the guidance of the mentor/supervisor.

It is hoped that the mentor uses the outcome of this project for applying projects and bringing out publications in CBIT listed journals. The original requisition letters addressed to the principal by the mentor/students are herewith returned.

Dr. A D Sarma
Advisor R&D

Principal
Chaitanya Bharathi Institute of Technology (A)
Gandipet, Hyderabad-500 075.

22nd April,2023
Hyderabad

To
The Principal
Chaitanya Bharati Institute of Technology
Gandipet

Through proper channel (Director, R and D).

Subject: Request for Internal Student Project Funding,CBIT

Respected sir,

We, Nitin Badhe (160120805043) and K. Chetan Babu (160120805052) students of 3rd year Biotechnology, CBIT are writing this letter to request you regarding the internal student funding proposal for our project entitled "Bioplastic from Seaweeds" under the guidance of Dr Rajasri Y , Associate Professor, Dept of Biotechnology. The amount sanctioned will be used for analysis of samples and used for improving the quality of the bioplastic.

We hope that you accept our proposal to help us continue our research.

Thanking you

Yours Sincerely,

Nitin Badhe
(160120805043)

K. Chetan Babu
(160120805052)

9515102173
(Nitin Badhe)

Please consider
25/4/23

Forwarded for consideration,
25-4-2023

HEAD
Dept. of Bio-Technology
Chaitanya Bharathi Institute of Technology
Gandipet, Hyderabad-500 075.

Get Funded

Student projects:

CBIT encourages both undergraduate and post graduate students to carryout quality and application-oriented projects. Funding up to Rs. 10,000/- can be sanctioned. In exceptional cases, higher funding can also be considered.

Guide lines for applying funding:

i. Apply the project throughout the academic year.
ii. Send the hard copy of your proposal to the Director R&D through proper channelwith the following information

A. General Information

1.	Title of the Project	:	Bioplastic from Seaweeds
2.	Department	:	Biotechnology
3.	Students Details	:	Name: Nitin Badhe (160120805043) K. Chetan Babu (160120805052)
4.	Mentor Details	:	Dr. Y. Rajasri, Associate Professor, Department of Biotechnology
5.	Duration of the project	:	1 year
6.	Total Expenditure / Budget	:	10,000
7.	Abstract of the Project Proposal (100-150 words)	:	Plastics, particularly the most recent bioplastics made from corn, wheat, sugar beets, and sugar cane, are widely used in contemporary culture. While being more environmentally friendly than alternatives based on fossil fuels, these plastics compete for land with food grown for human use. Alginate and carrageenan, which are derived from brown and red algae, are examples of seaweed hydrocolloids that could be used to make bioplastic. Bioplastic is a biodegradable polymer made from natural resources. Bioplastics made from alginate and carrageenan are rigid and inflexible. Plastic can be made with plasticizers such polyethylene glycol, sorbitol, and glycerol to enhance its characteristics. **Keywords:** bioplastics, alginate carrageenan, fossil fuels, hydrocolloids, biodegradable

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B. Scientific/Technical Information

1.	Introduction-Aim and Objectives Aim: To develop bioplastic from seaweeds. Objectives: To prepare bioplastic with the following properties ➢ Biodegradable ➢ Good tensile strength and sustainability ➢ edible
2.	National and International Status 1. Uldis et al (2021) found that seaweed *Furcellaria lumbricalis* represents itself a promising material for bioplastics production in Latvia – according to rough estimates, about 50 t of dead seaweed could be gathered along the Kurzeme coast. Bioplastic manufactured within the present study can be used for food or other product packaging; this bioplastic is a priori evaluated as being not harmful to the environment and health. Carrageenan material quality was improved when adding selected plasticizers – potato starch and glycerine (20% glycerine added appeared to be the most advantageous amount to improve elasticity of bioplastic). Further research is needed to make the final material suitable for practical use.Seaweed communities on Western Latvia coast (the site of the current research) are represented predominantly by black carrageen *Furcellaria lumbricalis* populations. Dead carrageen is washed Ashore by waves and frequently piles up on a seashore and, accordingly, has been perceived as an annoying garbage by local community (according to rough calculations, about 300-400 tons of seaweed detritus have been removed from Liepaja beach annually [5]). Nevertheless, dead seaweed biomass could be recognized not as a waste but, on the contrary, as an underestimated valuable multipurpose feedstock for biogas, ethanol, agar, cosmetic products, bioplastics, etc. manufacturing (waste to resource approach). 2. Prabhakaran et al (2020) aimed to utilize the macroalgae *Kappaphycus alvarezii* (whole seaweed) which are being cultivated in the Gulf of Mannar region for bioplastic film production using the plasticizer PEG-3000.Kappa-carrageenan derived from *Kappaphycus alvarezii* seaweed was found suitable for the bioplastic film production. The bioplastic film made from seaweeds is biodegradable within a stipulated time period. In this study, the bioplastic film made out of *K.alvarezii* (3% w/v) showed superior physical and mechanical properties along with PEG-3000 as plasticizer when compared with the earlier results reported with different plasticizers. Further, using different plasticizers would improve the physical and mechanical properties of bioplastic films. Bioplastic films produced using seaweeds and PEG-3000 has to be subjected to degradability, renewability and edibility tests to find its suitability in food and non-food packaging applications. Further research has to be taken for the utilization of bioplastic film from *Kappaphycus* with respect to commercial and economic viability.

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3.	Methodology of Analysis • To perform tests regarding the physical, chemical and biological properties pertaining to bioplastics • Develop a Bioplastic sheet • Characterization of Bioplastic sheets • Degradation studies of Bioplastic sheets <u>Characterization method:</u> **Fourier transform infrared spectroscopy** Fourier transform infrared spectroscopy (FTIR) is a technique for the characterization/identification of organic, inorganic, and polymeric materials. Use infrared to scan the sample and observe its chemical properties. Molecules absorb light primarily in the infrared region of the electromagnetic spectrum, and the absorption corresponds specifically to the bonds present within the molecule. This includes wavelength scanning and vibrational energy level transitions. The infrared range is divided into three regions: Near infrared (12500 cm-1 - 4000 cm-1), mid infrared (4000 cm-1 - 600 cm-1), far infrared (600 cm-1 - 50 cm-1). Each molecule's IR spectrum is unique and is called the molecule's fingerprint. The secondary structure and conformational changes of the bioplastic sheets were investigated using a JASCO International Co./Japan Fourier transform infrared spectrometer with a spectral resolution of 4 cm in the spectral range of 4000–400 cm. Air was confirmed by FTIR spectroscopy and 32 scans as a reference. Model FTIR-6300 instrument. **X-ray diffraction (XRD)** X-ray diffraction (XRD) is a rapid analytical technique used for phase identification of crystalline materials and provides information on unit cell dimensions. The X-ray beam hits the material and is diffracted uniformly in all directions at specific angles by the atoms of the material and detected by a detector to determine the crystalline or amorphous nature of the sample, phase identification, grain size, and elemental Information about the composition is obtained. Thin film. The bioplastic film was cut to a size of 1 cm x 1 cm and placed in a square sample holder. A sampling rate of 0.2° min and diffraction angles from 20° to 80° were acquired. **UV-visible spectrophotometer** UV-visible spectrophotometers can be single-beam or dual-beam. In a single beam, light passes through the sample and is detected by a detector. In a double beam, the light passes through a monochromator and the monochrome beam is split into two beams and passes through the sample. The intensity of the transmitted light then passes through a detector, converting the optical signal into an electrical signal. The detector is connected to an operating system that provides output data. water absorption A small sample piece was cut to a size of 2 cm x 2 cm. Initial weights were measured,

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	before immersion. The samples were immersed in water for 24 hours at room temperature. A sample was removed, dried and the final weight recorded. The amount of water absorbed was calculated using the following formula: Water absorption rate (%) = ([final weight (g) - initial weight (g)] / initial weight) x 100 Soil degradation research The biodegradation behavior of bioplastics was determined by soil burial decomposition. By burying bioplastics in the ground and allowing them to completely decompose, we investigated the degree of decomposition of bioplastics. Reducing the mass of buried samples indicates bioplastic degradation. Bioplastics made from various banana peels were cut into 1cm x 1cm pieces and buried to a certain depth. Before burial, we measured the initial mass (before decomposition) and final mass (after decomposition) of the bioplastic, and measured the biodegradability when the bioplastic was completely degraded. Mass loss is calculated using the following formula: Degradation rate (%) = ([Final mass (g) – Initial mass (g)]/Initial mass) x 100
4.	**Summary** Plastics are synthetically manufactured polymeric materials. Produced by the polymerization of complex organic materials, they can be formed into various shapes and sheets and pressed into fine filaments and fibers by applying heat and pressure. It is formed from cross-linked monomer units, which gives the polymer its rigidity and thermal stability. Plastic types include PVC, polystyrene (polymerized styrene, $CH=CHC_6H_5$), polyethylene (polymerized ethylene, $CH_2=CH_2$), and polypropylene (polymerized propylene, $CH_2=CHCH_3$). The plastic polymers PVC, high-density polyethylene, and low-density polyethylene are commonly used for plastic packaging (Noor et al 2017). The usage of plastic is wide enough in all our daily use such as food packaging, school, office, automotive, communication, transportation, pharmaceuticals, household materials, lamination, packing of materials and many other fields due to its advantage of being flexible, transparent, low weight, cost efficient, thermal and chemical stability, solar radiant, insulating properties and resistant to microbial degradation (Sofiah et al 2019).Today most of the available plastic is synthetically produced from basic raw materials, crude oil and natural gas and several other chemicals serve as starting materials for manufacture of various plastics (Kalia et al 2000). World-wide over 140 million tons of petroleum-based polymers are produced every year and used in manufacture of plastics and its derivatives from raw materials natural gas, crude oil, and coal (Barry 2009). Also, these synthetic plastics are non-biodegradable and they remain in the environment for long, causing the landfill deposition problems, toxicity, deposition in water bodies thereby increasing the Biological Oxygen Demand (BOD), disturbing the carbon chain, and adversely affects the biodiversity. Along with this burning of plastic causes air pollution, emission of green-house gases and incineration. Only 10% of this discarded plastic is recovered through recycling for the production of inferior products, while the rest takes a very long time to dust and decompose (Kalia, 2000). The depletion of fossil and chemical energy, land use, and the burning of fossil fuels are all factors that have a detrimental impact on the environment, making it necessary to sustainably change current industrialization and lifestyles and increase the use of plastics. (Piemonte, 2011)).
5.	Work plan / Pert chart

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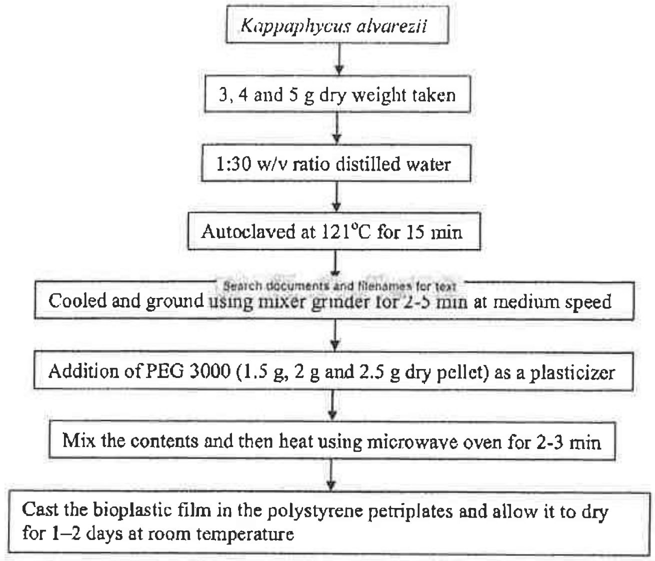
Gandipet, Hyderabad-500 075.

	
6.	Budget Details: Fourier transform infrared spectroscopy - 2000/- X-Ray Diffraction (XRD)- 3000/- SEM (Scanning Electron Microscope)- 3000/- TGA DSC – 2000/-
7.	References Yong, W. T. L., Thien, V. Y., Rupert, R., & Rodrigues, K. F. (2022). Seaweed: a potential climate change solution. *Renewable and Sustainable Energy Reviews*, *159*, 112222. Lim, C., Yusoff, S., Ng, C. G., Lim, P. E., & Ching, Y. C. (2021). Bioplastic made from seaweed polysaccharides with green production methods. *Journal of Environmental Chemical Engineering*, *9*(5), 105895. Yusmaniar, Y., Syafei, D. I., Arum, M., Handoko, E., Kurniawan, C., & Asali, M. R. (2019, December). Preparation and characterization of Seaweed based Bioplastic Blended with Polysaccharides derived from various seeds of Avocado, Jackfruit and Durian. In *Journal of Physics: Conference Series*(Vol. 1402, No. 5, p. 055097). IOP Publishing. Hii, S. L., Lim, J. Y., Ong, W. T., & Wong, C. L. (2016). Agar from Malaysian red seaweed as potential material for synthesis of bioplastic film. *Journal of Engineering Science and Technology*, *11*(7), 1-15.

19.04.2023

(Head of Department)

HEAD
Dept. of Bio-Technology
Chaitanya Bharathi Institute of Technology
Gandipet, Hyderabad-500 075.

(Mentor)

Principal
Chaitanya Bharathi Institute of Technology (A)
Gandipet, Hyderabad-500 075.

Chaitanya Bharathi Institute of Technology
Research and Development Centre
Research and Entrepreneurship Hub

CBIT / R&E Hub / R&D / Students Projects / 08 /dt.28 Apr 2023

28 Apr 2023
Hyderabad

To
The Principal

Sub: Funding of Student Project

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Recently one BE final year student batch submitted application for funding their project work and the same is reviewed. Initially, the presentation is given in presence of the Advisor-R&D and a couple of modifications are suggested. Those suggestions are taken into account in the revised version. After due consideration of the importance and relevance of the project to the aims and objectives of the institution, the following project is recommended with the mentioned funding for further processing. The following are the details.

S. No	Name of the Student	Mentor / Supervisor	Title of the Proposal and proposed budget (Rs)	Date of Presentation	Remarks
1.	Divya Prema Suroju and Banalla Shreya	Dr.Y Rajasri	Rs.10,000 /-	26 Apr 2023	Recommended
Recommendation		An amount of **Rs. 10,000/-** may be sanctioned			

After completion of the project, the students are advised to give a presentation on the proposed objectives and obtained results/deliverables in the presence of mentors. Also directed to submit a video of a maximum of 5 minutes and a comprehensive report to the undersigned with a copy to the Principal. Any components/subsystems bought under this project will remain with the respective departments. All the accounts related to the sanctioned amount are to be settled with the account section by the students under the guidance of the mentor/supervisor.

It is hoped that the mentor uses the outcome of this project for applying projects and bringing out publications in CBIT listed journals. The original requisition letters addressed to the principal by the mentor/students are herewith returned.

Principal
Chaitanya Bharathi Institute of Technology (A)
Gandipet, Hyderabad-500 075.

Dr. A D Sarma
Advisor R&D

22nd April,2023
Hyderabad

To
The Principal
Chaitanya Bharati Institute of Technology
Gandipet

Through proper channel (Director, R and D).

Subject: Request for Project Funding

Respected sir,

We, Divya Prema Suroju (160120805009) and Banalla Shreya (160120805027) students of third year B.Tech Biotechnology, CBIT are writing this letter to request you regarding the internal student funding proposal for our project entitled "PHB production and extraction" under the guidance of Dr Rajasri Y, Associate Professor, Dept of Biotechnology. The amount sanctioned will be used for material, analysis of samples and used for improving the quality of the bioplastic using PHB.

We hope that you accept our proposal to help us continue our research.

Thanking you

Yours Sincerely,

Divya Prema Suroju
(160120805009)

Banalla Shreya
(160120805027)

9701964241
(Divya)

Please consider

Forwarded for consideration,

25-4-2023

HEAD
Dept. of Bio-Technology
Chaitanya Bharathi Institute of Technology
Gandipet, Hyderabad-500 075.

Principal
Chaitanya Bharathi Institute of Technology
Gandipet, Hyderabad-500 075.

Get Funded

Student projects:

CBIT encourages both undergraduate and post graduate students to carryout quality and application-oriented projects. Funding up to Rs. 10,000/- can be sanctioned. In exceptional cases, higher funding can also be considered.

Guide lines for applying funding:

i. Apply the project throughout the academic year.
ii. Send the hard copy of your proposal to the Director R&D through proper channelwith the following information

A. General Information

1.	Title of the Project	:	PHB extraction from Algae
2.	Department	:	Biotechnology
3.	Students Details	:	Name: Shreya Banalla (160120805027) Divya Prema Suroju (160120805009)
4.	Mentor Details	:	Dr. Y. Rajasri, Associate Professor, , Department of Biotechnology
5.	Duration of the project	:	1 year
6.	Total Expenditure / Budget	:	10000
7.	Abstract of the Project Proposal (100-150 words)	:	A developing issue is the relevance of non-biodegradable plastic garbage. Instead, research is being done to produce bioplastics based on current reserves' biodegradable characteristics. Because they are expensive, experts are currently looking for alternatives including bacteria, microalgae, actinomycetes, cyanobacteria, and plants. Thermoplastics made of PHB are biodegradable, environmentally friendly, and biocompatible. In the last 50 years, the use of plastics has multiplied twenty-fold, and in the following 20 years, it is predicted to double once more. An estimated 330 million tonnes of plastics are manufactured annually globally. Plastics' creation, use, and disposal have been identified as a recurring and prospective environmental annoyance. Bio-based plastics are becoming increasingly sustainable and are expected to substitute fossil-based plastics.

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Gandipet, Hyderabad-500 075.

B. Scientific/Technical Information

1.	Introduction-Aim and Objectives Aim: Extraction of PHB for bioplastic preparation Objectives: To extract PHB from algae and use as plasticizer for bioplastic preparation
2.	National and International Status Morais et al (2015) extracted poly(3-hydroxybutyrate) (PHB) from the microalgal biomass of *Spirulina* LEB 18 for the development of nanofibers by electrospinning method. Different extraction methods were tested. The maximum yield obtained was 30.1 ± 2%. It was possible to produce nanofibers with diameters between 826 ± 188 nm and 1,675 ± 194 nm. An increase in the nanofiber diameter occurred when a flow rate of 4.8 $\mu L\ min^{-1}$ and a capillary diameter of 0.90 mm were used. The nanofibers produced had up to 34.4% of biomass additives, i.e., non-PHB materials. This can be advantageous, because it enables the conservation of microalgal biomass compounds with bioactive functions. The *Spirulina* LEB 18 microalga had a maximum concentration in PHB1 (30.1 ± 2%). The smallest diameter of nanofibers developed was 826 ± 188.0 nm, obtained in PHB3 with 30% solution. The PHB2 extraction method produced a polymer with a green colour and with maximum content of non-PHB materials (34.4% impurities). This is a desirable outcome for the application of nanofibers in the medical and food fields, because active components in the microalga are preserved and these may assist in cell growth and the development of edible packaging. Selvaraj et al. (2021) used fresh water microalgae which produces PHB as it has an increasing demand and a wide range of applications. It also acts as a biopolymer for the production of bioplastics. The determined the efficacy of biomass production and yield of PHB producing microalgae. The parameter was optimized as pH 7, temperature 30°C, under sunlight with 0.2% of sodium bicarbonate for higher biomass and PHB production. The extracted PHB were characterized through SEM, EDAX, XRD and FT-IR. In GC-MS analysis the major peak represents Benzyl butyl phthalate confirming the polymer of PHB. DSC-TGA, was performed and the melting peak of PHB was found as 342.1°C conferring to thermogravimetric analysis, the range of temperature for rapid thermal degradation of PHB was at 418°C to 420°C with the degradation peaking at 418.2°C the total weight loss within this temperature range was 98.5%. Hence, maximum 80% of PHB was produced from *Chlorella* sp. in addition to sequestering CO_2. The microalgae strains isolated showed PHB accumulation, proving *Chlorella* sp. as a good source of PHB. The optimum physicochemical conditions for PHB accumulation were; pH 7, 30°C, sunlight with 0.2% of sodium bicarbonate (carbon source) *Chlorella* sp. accumulated 80% at of PHB under these optimized condition, FTIR, XRD, GCMS analyses confirmed the isolated polymer as PHB. Thermal properties and mechanical properties of the isolated PHB were similar to standard PHB. *Chlorella* sp. as PHB producers have the benefit of altering waste carbon dioxide, greenhouse gas to eco-friendly plastics by utilizing the energy of sunlight. Hence it may be concluded that *Chlorella* sp. can be exploited for PHB production at a larger scale.
3.	Methodology of Analysis

Principal
Chaitanya Bharathi Institute of Technology (A)
Gandipet, Hyderabad-500 075.

<table>
<tr><td></td><td>Gas Chromatography Mass Spectroscopy
High Performance Liquid Chromatography
NMR Spectroscopy
Fourier transform infrared spectroscopy
X-Ray Diffraction (XRD)</td></tr>
<tr><td>4.</td><td>Summary of the work to be carried out in about 200 words
Production and extraction of Polyhydroxy Butyrate (PHB) from algae and certain microbes for preparation of bioplastics.

Method for PHB extraction from algal biomass

One gram of algal biomass (whatever isolated test organism or collected from HRAP) was suspended in sterile water and homogenized then allowed for mixing with a vortex. From 2 ml of suspension, 2 ml of 2 N HCL was added then heated for 2 h in a water bath. Then, the tube was centrifuged at 6000 rpm for 20 min and 5 ml of chloroform is added and left overnight at 28 °C on a shaker at 150 rpm. Then, it was centrifuged at 2000 rpm for 20 min, extracted with 1 ml of chloroform, and dried at 40 °C. Five millilitres of concentrated sulfuric acid was added to the tube and the mixture was heated at 100 °C in a water bath for 20 min. After the PHB crystals were converted to crotonic acid. The PHB content was measured at 235 nm in UV spectrophotometer against sulfuric acid blank. From the cell dry weight and PHB content, the percentage of PHB produced by the organisms was calculated.

Procedure for PHB quantification

Weigh 0.01 g of commercially available His PHB into a glass tube and dissolve in 10 ml of chloroform by heating in a water bath (65–70 °C) until the solution becomes clear. This will give a 1 mg/mL PHB stock solution. Seal with a glass stopper during heating. Make a 100 µg mL 1PHB stock solution by pipetting 1 mL of the 1 mg/mL stock solution into a new tube containing 9 mL of chloroform, heat the tube (65–70 °C), and vortex. He adds H2SO4 at a concentration of 10 ml to a tube sealed with a glass stopper. Heat the tube in a boiling water bath (94-96°C) for 20 minutes to fully convert PHB to crotonic acid. One millilitre of this sample is then transferred to a silica cuvette for spectrophotometry. Using the scanning program of the spectrophotometer software, scan the sample between 190 and 800 nm of the spectrum for the 235 nm peak corresponding to crotonic acid. Use concentrated H2SO4 as the zero point (empty). A standard curve was obtained by plotting each absorbance at 235 nm against each PHB weight.</td></tr>
<tr><td>5.</td><td>Work plan / Pert chart</td></tr>
</table>

Principal
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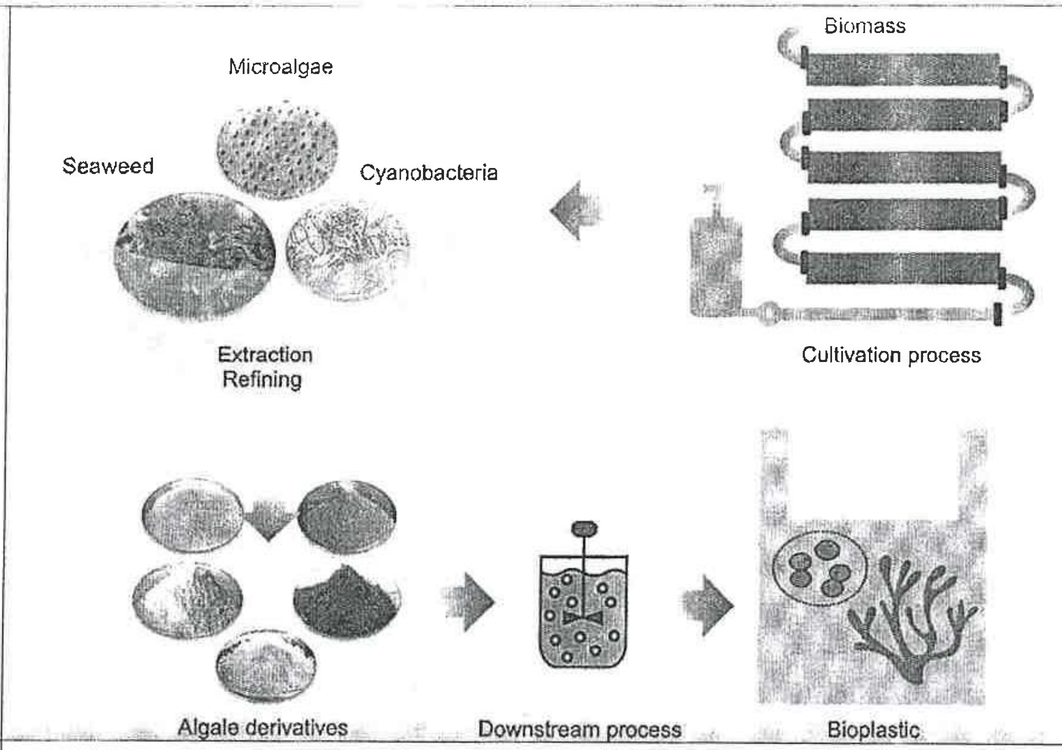

6.	**Budget Details** Fourier transform infrared spectroscopy - 2000/- X-Ray Diffraction (XRD)- 3000/- TEM (Transmission Electron Microscope)- 3000/- TGA DSC - 2000/-
7.	**References** Sudhakar, M. P., Magesh Peter, D., & Dharani, G. (2021). Studies on the development and characterization of bioplastic film from the red seaweed (Kappaphycus alvarezii). *Environmental Science and Pollution Research*, *28*, 33899-33913. Tůma, S., Izaguirre, J. K., Bondar, M., Marques, M. M., Fernandes, P., da Fonseca, M. M. R., & Cesário, M. T. (2020). Upgrading end-of-line residues of the red seaweed Gelidium sesquipedale to polyhydroxyalkanoates using Halomonas boliviensis. *Biotechnology Reports*, *27*, e00491. Sathish, A., Glaittli, K., Sims, R. C., & Miller, C. D. (2014). Algae biomass based media for poly (3-hydroxybutyrate)(PHB) production by Escherichia coli. *Journal of Polymers and the Environment*, *22*, 272-277. Abdo, S. M., & Ali, G. H. (2019). Analysis of polyhydroxybutrate and bioplastic production from microalgae. *Bulletin of the National Research Centre*, *43*(1), 1-4. Morais, M. G. D., Stillings, C., Dersch, R., Rudisile, M., Pranke, P., Costa, J. A. V., & Wendorff, J. (2015). Extraction of poly (3-hydroxybutyrate) from Spirulina LEB 18 for developing nanofibers. *Polímeros*, *25*, 161-167.

7.04.2023

HEAD
Dept. of Bio-Technology
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Gandipet, Hyderabad-500 075.

(Head of Department)

Principal
Chaitanya Bharathi Institute of Technology (A)
Gandipet, Hyderabad-500 075.

(Mentor)

Chaitanya Bharathi Institute of Technology
Research and Development Centre
Research and Entrepreneurship Hub

CBIT / R&E Hub / R&D / Students Projects / 06 /dt.23 Mar 2023

23 Mar 2023
Hyderabad

To
The Principal

Sub: Funding of Student Project

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Recently one BE final year student batch submitted application for funding their project work and the same is reviewed. Initially, the presentation is given in presence of the Director-R&D and a couple of modifications are suggested. Those suggestions are taken into account in the revised version. After due consideration of the importance and relevance of the project to the aims and objectives of the institution, the following project is recommended with the mentioned funding for further processing. The following are the details.

S. No	Name of the Student	Mentor / Supervisor	Title of the Proposal and proposed budget (Rs)	Date of Presentation	Remarks
1.	Aishwarya CVS, Vaishnavi Mokkapati and Kansoth Abhishek Naik	Dr. K Dharmalingam	Fabrication and Characterization of stimuli responsive hydrogel films for potential applications in drug delivery Rs. 10,100/-	11 March 2023	Recommended
Recommendation		An amount of **Rs. 10,000/-** may be sanctioned			

After completion of the project, the students are advised to give a presentation on the proposed objectives and obtained results/deliverables in the presence of mentors. Also directed to submit a video of a maximum of 5 minutes and a comprehensive report to the undersigned with a copy to the Principal. Any components/subsystems bought under this project will remain with the respective departments. All the accounts related to the sanctioned amount are to be settled with the account section by the students under the guidance of the mentor/supervisor.

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Principal
Chaitanya Bharathi Institute of Technology (A)
Gandipet, Hyderabad-500 075.

Dr. A D Sarma
Director R&D

Director - Research & Development
R&E Hub, CBIT(A)
Gandipet, Hyderabad-500075

Chaitanya Bhar...
Gandipet, Hyderabad-500 ...