Summary of Outcome of R&D Projects
Ministry of New and Renewable Energy , New Delhi

1. 0 Project Title : **Development of a Hybridized Bioreactor – Open Pond Cultivation System Integrating Sinusoidal Magnetic Field technology to Enhance the Qualitative and Quantitative Efficacy of Algal Biomass Production**

2.0 Project sanction no. & date : F.No 7/174/2011 Dated 04/10/2011

3.0 Project time frame : Dec.2011 – June,2013 (18 months)

4.0 Executing Institution : Phycospectrum Environmental Research Centre (PERC),52 A,AK block,7th Main Road,Annanagar,chennai-600040

5.0 Project Outlay : Rs.6.56 Lacs

6.0 Key Objective :

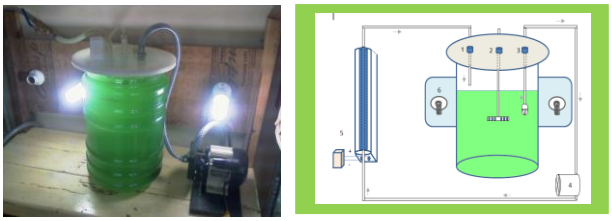
To demonstrate proof of concept regarding advatage of integrating sinusoidal Magnetic Field technology to enhance qualitative and quantitative efficacy of algal biomass production.

7.0 Project Outcome :

Fabrication and demonstration of a Photobioreactor (PBR) of 20 litre capacity integrated with Pulse Magnetic Field (PMF) pulse generator on lab scale for the production of algal biomass with better growth rates and yield.

8.0 Significant achievements summarizing technology development and commercialization

- Integration, optimization and standardization of PMF technology with 10 liter capacity Photobioreactor and upscaled to 20 liter capacity on laboratory scale to improve both productivity and biofuel efficiency in micro algae.
- The present technology was demonstrated with two micro algae viz. *Chlorella vulgaris* (micro green algae) and *Chroococcus turgidus* (micro blue green algae) exposed to various combinations of PMF (HZ and mG) in a 20 L PBR.
- The PMF technology concept was proved with encouraging results on laboratory scale i.e exposure to PMF for 4 to 6 hrs per day improved growth and oil production (improved FAME %) with an added advantage of enhanced prodution of omega 3 fatty acids.
- These observations are very significant because a stress which enhances oil production will normally reduce biomass.



Photobioreactor fitted with a pulsed Magnetic Field device

production ; but PMF stress enhanced production of both biomass and oil content in micro algae.

9.0 S & T benefits

Patent : application is in processing

10.0 Future direction for Research :

10.1 Short term goals (next two years):

- Implementation of the present PMF technology at pilot scale and integration of PMF unit with a raceway pond at pilot scale.
- Evaluation of techno-economic feasibility of the process with major thrust on energy input in the process on pilot scale.

10.2 Long term goals (Next five years):

- After a successful demonstration of the PMF technology at pilot scale this technology has to be implemented in large scale plants with more species of micro algae after standardization of PMF for each species.

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