

Microalgae biomass production for CO₂ mitigation and biodiesel production

Opinion

Microalgae are photosynthetic organisms found in both marine and fresh water ecosystem. They have simpler cellular structures and grow in submerged environment in contact to water, CO₂ and other nutrients needed for their growth and survival. Most common microalgae species like *Chlorella*, *Neochloris*, *Cylindrotheca*, *Dunaliella*, *Nitzschia*, *Phaeodactylum*, *Porphyridium*, *Cryptocodinium*, *Isochrysis*, *Nannochloris*, *Nannochloropsis*, *Schizochytrium*, *Tetraselmis* etc. have high lipid contents ranging between 20-50%. Microalgae have potentially innately high lipid content, instant adaptability and sustainability compared to conventional crops. Microalgae can grow on a wide range of wastewaters like municipal sewage, dairy wastewater, food processing wastewaters, poultry wastewaters, paper mill effluents, primary and secondary treated pharmaceutical effluents. Microalgae cultivation in wastewaters helps in the consumption of polluting nutrients from the wastewaters coupled with biomass generation, which offers the co-benefit of producing biodiesel accompanied with removal of nitrogen, sulphur, phosphorus and organic carbon. To meet the growing demand of energy systems by the growing population and economy, the emerging bio fuel technology lays great emphasis towards the economic sustainability. Biodiesel production from microalgae has an imminent scope towards reducing vehicular CO₂ exhaust, sequestering atmospheric CO₂, biological wastewater treatment technologies, reducing global warming through industrial flue gases-CO₂ mitigation etc. The utilization of open ponds and closed photo bioreactors for the mass cultivation of microalgae in pilot scale is suggested to enhance the efficiency of wastewater treatment and CO₂ sequestration on a large

scale and biomass production. These microalgae biomass can also be used for bio-gasoline, bio hydrogen, bio-methane, bio-plastics etc.

Conflicts of Interest

The authors declare no conflict of interest.

Acknowledgments

None.

Funding

None.

Volume 4 Issue 4 - 2017

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Received: March 01, 2017 | **Published:** March 24, 2017