Pavantheja /J. Pharm. Sci. & Res. Vol. 12(4), 2020,555-557

ISSN:0975-1459
Journal of Pharmaceutical Sciences and Research
www.jpsr.pharmainfo.in

Biodiesel Fuel Production from Algae as Renewable Energy

Pavantheja,
Department of Biotechnology, Saveetha school of Engineering, Saveetha Institute of Medical And Technical science (SIMATS), Saveetha Nagar, Thandalam, Chennai 602105.

Abstract:
Biodiesel is biodegradable, less CO2 and NOx outflows. Constant utilization of oil sourced fills is presently generally perceived as impractical in light of draining supplies and the commitment of these energizes to the aggregation of carbon dioxide in the earth. Inexhaustible, carbon unbiased, transport fills are essential for natural and financial manageability. Green growth has developed as one of the most encouraging hotspots for biodiesel creation. It very well may be derived that green growth developed in CO2-enhanced air can be changed over to slick substances. Such a methodology can add to take care of serious issues of air contamination coming about because of CO2 advancement and future emergency because of a deficiency of vitality sources. This investigation was embraced to know the best possible transesterification, measure of biodiesel generation (ester) and physical properties of biodiesel. In this examination we utilized normal species Oedogonium and Spirogyra to look at the measure of biodiesel creation. Algal oil and biodiesel (ester) generation was higher in Oedogonium than Spirogyra sp. Be that as it may, biomass (after oil extraction) was higher in Spirogyra than Oedogonium sp. Residue (glycerine, water and shades) was higher in Spirogyra than Oedogonium sp. There was no distinction of pH among Spirogyra and Oedogonium sp. These outcomes demonstrate that biodiesel can be created from the two species and Oedogonium is preferable source over Spirogyra sp.

INTRODUCTION:

Bioenergy is one of the most significant parts to alleviate ozone depleting substance outflows and substitute of fossil fuels [Goldemberg]. The need of vitality is expanding ceaselessly, due to increments in industrialization and populace. The essential wellsprings of this vitality are oil, gaseous petrol, coal, hydro and nuclear [kulkarni et. Al]. The significant dis-service of utilizing oil-based powers is environmental contamination made by the utilization of oil diesel. Aside from these outflows, oil diesel is additionally significant wellspring of other air contaminants including NOx, Sox, CO, particulate issue and unpredictable natural compounds[Klass et. Al].Huge scale presentation of biomass vitality could add to feasible advancement on a few fronts, naturally, socially and economic[Turkenberg et. Al]. Biodiesel (monoalkyl esters) is one of such elective fuel, which is acquired by the transesterification of triglyceride oil with monohydric alcohols. It has been well-announced that biodiesel acquired from canola and soybean, palm, sunflower oil, algal oil as a diesel fuel substitute[Lang. Xl et. Al].. Biodiesel fuel can be set up from squander cooking oil, for example, palm, soybean, canola, rice wheat, sunflower, coconut, corn oil, fish oil, chicken fat and algae[Sharif et. Al] which would mostly diminish the reliance on oil-based fuel. The consuming of a tremendous measure of petroleum derivative has expanded the CO2 level in the environment, causing a worldwide temperature alteration. Biomass has been centered around as an elective vitality source, since it is an inexhaustible asset and it fixes CO2 in the air through photosynthesis. On the off chance that biomass is developed in a supported manner, its ignition has no effect on the CO2 balance in the air, on the grounds that the CO2 discharged by the copying of biomass is counterbalanced by the CO2 fixed by photosynthesis[R. H. Williams wt. Al]. Among biomass, green growth (large scale and microalgae) for the most part have a higher photosynthetic effectiveness than other biomass[Shay et. Al] detailed that green growth were probably the best wellspring of biodiesel. It can create up to multiple times the measure of oil per section of land as soybeans. Indeed, delivering biodiesel from green growth might be just the best approach to create enough car fuel to supplant current gas utilization. Green growth produces 7 to 31 time more prominent oil than palm oil. It is easy to separate oil from green growth. The best green growth for biodiesel would be microalgae. Microalgae are a life form fit for photosynthesis that is under 2 mm in distance across. Macroalgae, similar to ocean growth, isn't as broadly utilized in the creation of biodiesel. This incorporate methane delivered by anaerobic assimilation of the algal biomass] biodiesel got from microalgal oil[Thomas et. Al] and photobiologically created biohydrogen. Using microalgae as a wellspring of fuel isn't new[Kapdan et.Al] yet it is presently being paid attention to on account of the heightening cost of oil and, all the more fundamentally, the developing worry about an unnatural weather change that is related with consuming fossil fuels. Biodiesel (monoalkyl esters) is one of such elective fuel, which is acquired by the transesterification of triglyceride oil with monohydric alcohols. It has been well-announced that biodiesel acquired from canola and soybean, palm, sunflower oil. That is the reason we have done the exploration to know the best possible transesterification, measure of biodiesel creation (ester) and physical properties (yield of biodiesel, glycerine and residue) of biodiesel from green growth.

MATERIALS AND METHODS:

Site: The investigation was done in the research center of Bioresource Science, Department of Biotechnology, Institute of Biological Science, Faculty of Science, University of Malaya, Kuala Lumpur, Malaysia.

Test assortment: Two Petri dishes Algae (Oedogonium and Spirogyra sp., 26.5 and 20.0 g) were gathered from the Phycology lab, Institute of Biological Science, Faculty of Science, University of Malaya, Kuala Lumpur, Malaysia.

Oil extraction: Algae were ground with engine and pestle however much as could reasonably be expected. The ground green growth was dried for 20 min at 80°C in a

hatchery for discharging water. Hexane and ether arrangement (20 and 20 mL) were blended in with the dried ground green growth to extricate oil. At that point the blend was kept for 24 h for settling.

Biomass assortment: The biomass was gathered after filtration and weighted. Vanishing: The separated oil was dissipated in vaccum to discharge hexane and ether arrangements utilizing rotational evaporator.

Blending of impetus and methanol: 0.25 g NaOH was blended in with 24 mL methanol and mixed appropriately for 20 min.

Biodiesel creation: The blend of impetus and methanol was filled the algal oil in a cone like carafe. The accompanying response and steps were followed

Transesterification: The response procedure is called transesterification. The conelike carafe containing arrangement was shaken for 3 h by electric shaker at 300rpm.

Shetteling: After shaking the arrangement was kept for 16 h to settle the biodiesel and dregs layers plainly.

Seperation of biodiesel: The biodiesel was isolated from sedimentation by flagon separator cautiously. Amount sedimeant (glycerine, colors, and so forth.) was estimated.

Washing: Biodiesel was washed by 5% water until it was gotten perfect.

Drying: Biodiesel was dried by utilizing dryer lastly held under the running fan for 12 h.

Capacity: Biodiesel creation was estimated by utilizing estimating chamber, pH was estimated and put away for investigation.

RESULTS AND DISCUSSIONS

Percent Dry load of green growth (before oil extraction) was higher in Oedogonium than in Spirogyra sp. Separated oil was higher in Oedogonium than in Spirogyra sp. Be that as it may, biomass (after oil extraction) was lower in Oedogonium than in Spirogyra sp. Biodiesel creation (methyl ester) was discovered most extreme in Oedogonium sp. furthermore, least in Spirogyra sp. Subsequently, our outcomes demonstrate that biodiesel can be delivered from large scale green growth however it contains lower lipid content than smaller scale green growth. Also, it appears that Oedogonium sp. is higher biodiesel containing green growth than spirogyra sp. At long last we unequivocally suggest that biodiesel can be delivered from macroalge. By along these lines green growth can be utilized as sustainable source. Biodiesel can be delivered from full scale green growth due to lipid substance.They likewise revealed that fish oil was the significant wellspring of DHA, yet on the other hand it may be delivered by utilizing of microorganisms. Marine microorganisms may contain enormous amounts of DHA and were viewed as a potential wellspring of this significant unsaturated fat. A portion of these creatures could be developed heterotrophically on natural substrates without light. It has been accounted for that largescale green growth contain lipid substance of 1.3-7.8% (dw). Vincecateproposed that ocean growth contain about 5.5% oil. Heterotrophic development of certain marine eukaryotes, for example, the microalgae, is upgraded in this medium. The examples gathered from these models produce lipid divisions containing Omega-3 unsaturated fats. After extraction and esterification to frame the methyl esters, gas chromatographic investigations show that the ω-3 unsaturated fats may establish as much as 10 to half of the absolute unsaturated fat portion. analysts detailed that biodiesel was gotten from microalgal oil. The transesterification of utilized oil delivered biodiesel by, utilizing a basic impetus, KOH. Two kinds of utilized oils (mostly hydrogenated soybean oil and margarine) were trans esterified with methanol, ethanol, 1-propanol, 2-propanol, 1-butanol and 2-ethoxyethanol. Basu and Norris have built up a procedure to deliver esters from feedstocks that have a high FFA content, diglycerides and monoglyerides, utilizing calcium and barium acetic acid derivation as an impetus. Zhang et al. created four distinctive persistent procedure stream sheets for biodiesel generation from virgin oil or waste vegetable oil utilizing basic or acidic conditions. Yusuf clarified about biofuel from microalgae. He referenced that biodiesel got from oil crops is a potential inexhaustible and carbon nonpartisan option in contrast to oil powers. Microalgae give off an impression of being the wellspring of inexhaustible biodiesel that is equipped for satisfying the worldwide need for transport energizes. Like plants, microalgae use daylight to deliver oils yet they do so more proficiently than crop plants. Oil profitability of numerous microalgae incredibly surpasses the oil efficiency of the best creating oil crops.

CONCLUSION:

Green growth is an efficient decision for biodiesel creation, in view of its accessibility and minimal effort. Our outcomes demonstrate that biodiesel can be delivered from macroalge. Thusly green growth can be utilized as sustainable power source. Numerous scientists revealed that microalgae may better for higher biodiesl generation. So, our outcomes recently featured by creating biodiesel from macroalgae however it contains lower lipid content. Further research ought to be finished having macroalgae and microalgae to think about the proportion of biodiesel creation, substance examination and factual hugeness.

REFERENCES:

1. Banerjee, A., R.S. harma, Y. Chisti and U.C. Banerjee, 2002. Botryococcus braunii: A renewable source of hydrocarbons and other chemicals. Crit. Rev. Biotechnol.,22: 245-279.
2. chemical industry. Biotechnol. Adv., 23: 471-99.
3. Chisti, Y., 1980-1981. An unusual hydrocarbon. J. Ramsay Soc., 27-28: 24-26
4. Fedorov, A.S., S. Kosourov, M.L. Ghirardi and M. Seibert, 2005. Continuous H_2 photoproductionby Chlamydomonas reinhardtii using a novel two-stage, sulfate-limited chemostat system. Appl. Biochem. Biotechnol., 124: 403-12.
5. Gavrilescu, M. and Y. Chisti, 2005. Biotechnology-a sustainable alternative for
6. Goldemberg, J., 2000. World Energy Assessment, Preface. United Nations Development Programme, New York, NY, USA.
7. Hall, D.O., H.E. Mynick and R.H. Williams, 1991. Cooling the greenhouse with bioenergy. Nature, 353: 11.
8. Kapdan, I.K. and F. Kargi, 2006. Bio-hydrogen production from waste materials. Enzyme Microbial. Technol., 38: 569-82.
9. Klass, L.D., 1998. Biomass for Renewable Energy, Fuels and Chemicals, Academic Press, New York, pp: 1-2.

10. Kulkarni, M.G. and A.K. Dalai, 2006. Waste cooking oil-an economical source for biodiesel: A review. Ind. Eng. Chem. Res., 45: 2901-2913.
11. Lang, X., A.K. Dalai, N.N. Bakhshi, M.J. Reaney and P.B. Hertz, 2002. Preparation and characterization of biodiesels from various Bio-Oils. Bioresource. Technol., 80: 53-62.
12. Macedo, I.D.C., 199. Energy from biomass and wastes. Biomass Bioenergy, 3: 77-80.
13. Roessler, P.G., L.M. Brown, T.G. Dunahay, D.A. Heacox, E.E. Jarvis and J.C.12.
14. Schneider, 1994.Genetic-engineering approaches for enhanced production of biodiesel fuel from microalgae. ACS Symp Ser. 566: 255-270.
15. Sharif, A.B.M.H, A.B. Nasrulhaq, H.A.M., Majid, S. Chandran and R. Zuliana, 2007. Biodiesel production from waste cooking oil as environmental benefits and recycling process. A Review. Asia Biofuel Conference Book. Dec. 11-13. Singapore.
16. Shay, E.G., 1993. Diesel fuel from vegetable oils: Status and Opportunities. Biomass Bioenergy, 4: 227-242.
17. Spolaore, P., C. Joannis-Cassan, E. Duran and A. Isambert, 2006. Commercial applications of microalgae. J. Biosci. Bioeng., 101: 87-96.
18. Thomas, F.R., 2006. Algae for liquid fuelproduction Oakhaven Permaculture center.
19. Turkenburg, W.C., 2000. Renewable energy technologies. In: Goldemberg, J. (Ed). World Energy Assessment, Preface. United Nations Development Programme, New York, USA, pp: 219-27