
POSTER

Improvements in the production of fat for biodiesel from sludge from treatment plants wastewater.



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ABSTRACT

The final goal of this research project is to improve the production of fat for biodiesel from sludge from treatment plants of wastewater (E.D.A.R). To produce such biodiesel, the methanol and the fats are necessary, and the fats are obtained from the growth of *C. elegans* in these sludge. It is known that the nematode *Caenorhabditis elegans* has the ability of generating and accumulating a high percentage of fat (around 35% of dry weight), apart from having a wide range of edible bacteria, which can feed the different microorganisms present in the mud of the sewage treatment plant.

This research project could be divided into three different parts. Firstly, for optimal growth of this organism (considered as model), there is a laboratory's protocol with liquid culture which indicates that would be favorable the addition of seven compounds (NaCl, KH₂PO₄, cholesterol, Potassium citrate, Trace Metals, CaCl₂, MgSO₄). One of my goal is to try to reduce the number of compounds used, obtaining the same population growth of worms in the mud.

On the other hand, another objective is to try to improve the growth of the nematode population in the mud. To do this, we will apply different pre-treatments to the sludge and observe how the nematodes react to these changes during a week.

Finally, the last objective of the research investigation is to try to improve the fat's production for biodiesel. *C. elegans* has only a life cycle of three days in which present different stages from hatching: L1, L2, L3, L4 and adults and it may also appear the dauer larva, which is a stage of resistance, created by stress conditions.

It is known that dauer and adults are those ones which have a greater capacity to store the fats. To improve fat's production, we will use different strains of nematode, trying to synchronize so that all of them end up being dauer or adults and thus obtaining a higher amount of fats

REFERENCES

Bligh, E.G . and Dyer, W.J. (1959). A rapid method for total lipid extraction and purification. *Can J.Biochem. Physiol.* 37:911-917

Kyleann K. Brooks, Bin Liang, Jennifer L. Watts (2009). The Influence of Bacterial Diet on Fat Storage in *C.elegans*. *Plos ONE* 4(10): e7545.

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