

Poster

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



Manuel J. Muñoz Ruiz(1), Carlos López-Viso (2), Elena Fernández de Bobadilla Carrasco (1*)
 Área de Genética, Departamento de Biología molecular e ingeniería bioquímica, Centro Andaluz de Biología y el Desarrollo,
 Universidad Pablo de Olavide, carretera de Utrera km1 41013, Sevilla

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ABSTRACT

Motivation: Most of the energy sources currently used is derived from fossil fuels, whose reserves are limited. On the other hand, millions of tonnes of waste are generated worldwide from urban water treatment. Sewerage water is treated in wastewater treatment plants (WWTP) and passed through a depuration process that generates a waste in form of sludge. In an attempt to solve those two problems we are using a strategy which involve the nematode *Caenorhabditis elegans*. *C. elegans* is a free-living nematode used as a model organism for basic biological research. Its successful as model organism for biomedical research relay in several features: it is easy to manipulate, it has a small size, a fast life cycle, a small genome and a simple anatomy. Among other traits, the ability of generating and accumulating fat and the wide range of bacteria in its diet are remarkable for this project. The general aim of this research project is to optimize the production of nematode fat useful for biodiesel, using the sludge from water depuration plant as medium to growth the nematodes. During the develop of this project, three fundamental bottlenecks have been detected: first, the sludge is not completely assimilated by the nematodes. Second, each sludge sample is diverse and generates diverse nematode production and third, In regular medium is necessary to add seven fundamental components (NaCl, KH₂PO₄, cholesterol, Potassium citrate, Trace Metals, CaCl₂, MgSO₄) to have an optimal growth of *C. elegans*, which is an important economical-cost.

Methods: To overcome those problems, we have studied the effect of applying to the sludge a pretreatment and we are analyzing which of the components can be eliminated without affecting population growth. We also will analyze the amount of fat produced by the nematode with the Soxhlet method.

Results: The following results were obtained: Microwave pretreatment increase the number of the nematode in the sludge. Addition of NaCl, KH₂PO₄ and Potassium citrate generates a similar nematode growth than the addition of seven components.

Conclusions: We observed that it is necessary the addition of the NaCl, KH₂PO₄ and Potassium citrate to get an optimal growth of *C. elegans* in the sludge and microwave treatment generate an increase of nematode production in the sludge..

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