

Lipids Characterization in Oleaginous Yeasts Fermenting different Carbon Sources

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In recent years many studies have been focused on the development of fermentation processes for the production of biofuels in order to move the market dependence away from fossil based energy sources. First generation biofuels produced primarily from agricultural crops traditionally grown for food purpose, are the initial step in this direction. In order to avoid the competition with food crops, second generation biofuels will be manufactured from agricultural and forest residues and from ligno-cellulosic non-food energy crops. The hexose and pentose sugars obtained from ligno-cellulosic feedstock can be fermented to ethanol, butanol or lipid.

In present work the ability of some oleaginous yeasts in producing lipids from lignocellulosic sugars is studied. Scope of the work is to verify lipids pattern in some yeast species, when different carbohydrate sources are used. Four strains have been studied, belonging to *Rhodotorula spp.* and *Lipomyces spp.* genera.

Each strain was tested on five different carbon sources, under nitrogen limited conditions and lipid content was estimate between 90 and 200 hours of fermentation.

All strains showed the ability to grow on different sugars, among them *Lipomyces starkeyi* accumulates lipids on average 30% on a cellular biomass basis.

Cell disrupting and extraction method are described and lipid pattern for each strain and each sugar as a function of time was estimated.

The GC analysis after French press treatment and hexan:isopropanol (3:2) extraction has showed a good triglycerides production in 144h fermentation time, both for *Rhodotorula* and *Lypomices*; moreover there is a good performance with every carbon sources.