

Production of Single Cell Oil from *Rhodospiridium toruloides*

Zeynep Mutlu, Neşe Şahin Yeşilçubuk, Necla Aran

Istanbul Technical University, Department of Food Engineering, Maslak, 34469,
Istanbul, Turkey

Lipophilic compounds or oils obtained from microorganisms are referred to as “Single Cell Oils” (SCO) and considered as alternative sources of plant oils. Fatty acid composition of these lipids are mainly long chain ones that are generally similar to plant oils.

In recent years, polyunsaturated fatty acids (PUFA) have gained considerable attention about their health benefits in human and animal nutrition especially in the development of infants. PUFAs can be obtained from various sources such as plant seeds (linoleic, γ -linolenic acid (GLA) and α -inolenic acid (ALA)), marine fish (docosahexaenoic acid (DHA), eicosapentaenoic acid (EPA) and arachidonic acid (AA)) and certain mammals (AA). Genetically engineered plants, new crops and microorganisms are considered to be alternative sources in order to meet increasing demand to these functional fatty acids. In this context, microbial lipid production became popular as the importance of unsaturated fatty acids on human nutrition health is well understood. Among microorganisms, some fungi, algae and bacteria are able to produce high contents of PUFAs such as GLA, AA, EPA and DHA.

In this study the effects of different oil sources such as borage, sesame seed, canola, linseed and trout oil on biomass yield, lipid content and fatty acid composition of *Rhodospiridium toruloides* NRRL 27012 were investigated. Culture medium used in the study was yeast extract peptone dextrose (YEPD) broth.

According to the experimental results, biomass yield of *Rhodospiridium toruloides* and lipid content of the biomass were found to be in the range of 21.7-28 % and 25.5-32.2 %, respectively. Among the investigated oils, linseed oil was found to be the most promising oil for lipid production. Preliminary studies indicated that fatty acid compositions of the SCOs were in accordance with the fatty acid compositions of the oil sources.