Microalgae *Aurantiochytrium* sp. as an alternative source of squalene and DHA production process


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**Introduction**

There has been a growing trend worldwide in the use of squalene, due in part to its recognized health benefits and its range of applications. However, the growth of the industry around this resource has been very limited by the scarcity and limitations of sources of raw material for the production of this compound. Additionally, it is recognized the interest and strategy in the exploitation and recovery of by-products and waste resulting from biorefineries, promoting more sustainable and added value practices. The aim of this work is developed a viable biotechnological process for the simultaneous production of squalene and polyunsaturated fatty acids (docosahexaenoic acid - DHA), using as alternative source heterotrophic microalgae strain, *Aurantiochytrium* sp., under specific growth conditions.

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**Results**

- **Biomass Production**: The biomass production was observed to be higher in the cultures grown in 2,25 vvm airflow, with a maximum value of 1335 mgdw/L after 10 days of inoculation.
- **Squalene Production**: The squalene production was observed to be higher in the cultures grown in 2,25 vvm airflow, with a maximum value of 56 mgdw/L after 10 days of inoculation.
- **DHA Production**: The DHA production was observed to be higher in the cultures grown in 2,25 vvm airflow, with a maximum value of 54 mgdw/L after 10 days of inoculation.

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**Conclusions**

- No differences in the biomass production were observed between the cultures growth until 120h, after this time the airflow rate 1,70 vvm promotes the increase of biomass production.
- DHA was the major PUFA obtained, having been attained a maximum 7 days after inoculation. Biomass produced in culture medium with 1,70 vvm airflow rate showed a slightly higher DHA and DPA content.
- The low airflow rate stimulated the squalene and total lipids production.
- This study showed that the low airflow rate increases the squalene production but compromise the biomass productivity.
- The exhausted culture medium may be reused after compensation of the initial nitrogen and glucose levels.
- The ECM had 6 % of lipids which a similar fatty acids profile to that of biomass.

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**References**