



## Wastewater valorization adopting the microalgae accelerated growth

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### ABSTRACT

Microalgal biomass cultivation as a byproduct of wastewater treatment represents an interesting opportunity for wastewater valorization. Several studies analyzed the growth of microalgae in urban and agricultural wastewaters, evaluating the potential of microalgae strains to remove organic pollutants. To assess the actual environmental impact of such an integrated system, life cycle assessment (LCA) provides the proper tools for a comprehensive and effective analysis. In this study, olive mill wastewaters (OMW) are chosen and the selected microalgal strains are *Chlorella vulgaris* and *Scenedesmus quadricauda*. Technical activities were carried out to obtain, starting from OMW, a cultivation medium with the same composition of the synthetic substrate (BG 11) used to grow the selected microalgal strains. Then, by means of LCA, a comparison between the environmental burden of the different scenarios was performed. Particular attention was devoted to the environmental indicators and a sensitivity analysis was performed to account for the transportation of OMW from olive mills to a centralized OMW treatment plant. The results show that the wastewater valorization can bring about an environmental benefit if the treatment plant is properly located. This is largely due to the avoided impact of the OMW purification treatment.

*Keywords:* Olive mill wastewater; Microalgae; Wastewater valorization

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