

REDWINE project: use of *Chlorella vulgaris* to prevent biotic and abiotic stress in Palmela's region, Portugal, vineyards

Miguel Cachão^{1*}, Ana Chambel¹, Sérgio Pinto¹

¹AVIPE, R. D. João de Castro, 12 loja, 2950-206 Palmela, Portugal

*Corresponding author: miguel.cachao@avipe.pt

Abstract

The new EU Green Deal aims to achieve GHG emissions reduction by at least 55% by 2030 and a climate neutral EU economy by 2050.

REDWine concept will be realized through the establishment of an integrated Living Lab demonstrating the viability of the system at TRL 7. The Living Lab will be able to utilize 2 ton of fermentation off-gas/year (90% of total CO₂ produced in the fermenter) and 80 m³ of liquid effluent (100% of the liquid effluent generated during fermenter washing) to produce 1 ton (dry weight) of *Chlorella* biomass/year. This biomass will be processed under a downstream extraction process to obtain added-value extracts and applied in food, cosmetic and agricultural end-products and to generate a new EcoWine. REDWine will focus on the recovery of off-gas from a 20.000L fermenter of red wine production existing in Adega Cooperativa de Palmela (ACP, located in Palmela, Portugal).

REDWine's microalgae were tested in 2022 and 2023 with 4 purposes in vineyard: improve flowering stages, contribute to high temperature resistance, biofungicide against downy mildew and increasing in nitrogen content in ripening to help fermentation and improve aromatic compounds.

So far, results were interesting on wine making process but need more trials and results to assess vineyard activity.

Keywords: CO₂ sequestration, microalgae, vineyards, biotic and abiotic stress