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# Use of hydrolysates from waste microagal biomass for bioplastics production by *Paracoccus denitrificans*. A preliminary study

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Since the middle of the 20TH century, the introduction of plastics in the global market has produced a noticeable improvement in the comfort and the quality of life of humanity, being present not only in almost all aspects of our daily life, but also in the industry. Its versatility and humanity's astonishing technological development throughout the decades has deemed its application essential in almost every aspect. Even though the exact number of plastic wastes disposed in unregulated landfills or in nature remains unknown, it is estimated that approximately 5 to 13 million metric tons are disposed in the ocean around the globe. In that sense, many significant breakthroughs related to the production of biodegradable polymers from removable resources in the biotechnological field have been achieved, aiming for Cero Waste and Net-Cero $CO_2$ Emissions objectives. The polyesters produced by bacteria represent an specific type of biopolymer generated by microorganisms. Within the group, we can find Polyhydroxyalcanoates (PHAs), which can be synthesized by microorganisms as an energy storage mechanism. PHAs have presented promising results for its usage in the plastic industry, but its high production costs limit its production and utilization. For that reason, the main goal of this work is to evaluate the utilization of waste microalgal biomass as a carbon source for *Paracoccus denitrificants* PHAs production. *Scenedesmus almeriensis* based biomass grown on photo-bioreactor used for pig manure wastewater remediation was used for this analysis. Different types of hydrolysis (acid, alkaline and enzymatic) were used for recovering of carbon and nutrients from waste biomass. Hydrolysates, containing released monosaccharides and organic acids, among others components, were used as substrate for the production of PHAs. *Paracoccus denitrificants* were cultivated in minimum medium using the hydrolyzed as the only carbon source. The cellular growth was followed measuring DO 600 nm. The results show that both, acid and enzymatic hydrolyzed, are appropriate for *P denitrificans* growth, while alkaline hydrolyzed is not a suitable carbon source for the growth of *P denitrificans* and was discarted. After the cellular growth, the supernatant was separated by centrifugation (10.000 rpm, 10 minutes) and the total content of PHAs in the pellet was determinated by extraction with chloroform and measuring by Gas Chromatography coupled with a Mass detector. P *denitrificans* cultivated in acid hydrolyzed resulted in 4.99 mg $g^{-1}$, while the ones cultivated in enzymatic hydrolyzed resulted in a lower yield of 3.61 mg $g^{-1}$. All the results were expressed in dry basis. The results show that hydrolyzed waste microalgae biomass can be used as carbon source for the productions of PHAs using *Paracoccus denitrificans*.