J Bioremediat Biodegrad 2017, 8:5(Suppl)
DOI: 10.4172/2155-6199-C1-009

Phototrophic culture of *Chlorella sp*. using charcoal ash as an inorganic nutrient source

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Although several studies have recognized the suitability of employing ashes as a component of a culture medium or fertilizer, the number of these studies remains limited. The use of biomass ash as a nutrient source for algal culture is an unexplored research topic that should be investigated to analyse the possibility of reducing the costs associated with commercial microalgae culture.In this study, biomass ash from charcoal was used as a source of nutrients for the cultivation of Chlorella sp., and two alternative processes for nutrient supply were studied. First, various culture media containing the leachate stock solution from solid ash at different concentrations were prepared. Second, different amounts of solid ash were added directly to the culture media. The results indicated that the direct use of biomass ash mixed in water enables the formation of a more suitable medium compared with Guillard's f/2 medium because it promotes faster cell growth and higher biomass productivity. The higher biomass productivities were reached over the same period compared with those achieved with the culture media based on biomass ash leachates. Moreover, the nutrients in the media containing ash leachates are sufficient to maintain cell growth rates and biomass productivities that are comparable to those achieve with Guillard's f/2 medium.

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