## Abstract

The excessive consumption and improper disposal of the petroleum based plastics is resulting in the death of loads of animals, depletion of natural resources, and reduction in fertility of soil, despite of being flexible, cheap and persistent. Cyanobacteria-based plastics offer an attractive option with a minimum cost that will only require $CO_2$ and light and would have a great environmental impact. In this work, 4 different cyanobacterial strains (*Microcystis* sp., BERC03, *Plectonema terebrans* BERC01, *Lyngbya aestuarii* BERC06) were evaluated for PHAs production. The strains were cultured in BG11 medium, at initial pH 7.0, at 25°C, in the presence of white LED light of 3500 lux. PHAs synthesis by *Lyngbya aestuarii* and *Plectonema terebrans* was observed for first time. Maximum PHAs productivity (22.8% on CDW basis) was observed in *Lyngbya aestuarii*, at pH 7.5, in N-defficiency+1%sodium acetate conditions at 25°C after 21 days. Different parameters were optimized to study the physicochemical characteristics of PHAs produced by cyanobacteria. The adsorption peak at 1019.74 $cm^{-1}$, 1257.03 $cm^{-1}$, 1380.50$cm^{-1}$, 1460.60 $cm^{-1}$, 1650.51 $cm^{-1}$, 2848.6 $cm^{-1}$, 2912.27 $cm^{-1}$ and 3270.03 $cm^{-1}$ exhibited that the extracted polymer was PHAs. TGA analysis showed that extracted PHA polymer was stable below 290°C.