ABSTRACT

Despite being flexible, inexpensive, and persistent, the excessive consumption and incorrect disposal of petroleum-based plastics results in the death of many animals, the depletion of natural resources, and a decline in soil fertility. Cyanobacteria-based polymers provide an appealing low-cost solution that requires mainly CO_2 and light and has a significant environmental effect. In this work, *Plectonema* sp. was evaluated for PHAs production. The strain was cultured in BG11 medium, at initial pH 7.0, at 25°C, in the presence of white LED light. To the best of our knowledge, PHAs synthesis by *Plectonema* sp. was observed for first time. Maximum PHAs productivity (22% on CDW basis) was observed at pH 7.5, in N-defficiency+1%sodium acetate conditions at 25°C after 14 days. Different parameters were optimized to study the physicochemical characteristics of PHAs produced by *Plectonema* sp. The adsorption peaks in FTIR at 700 cm^{-1}, 1020.74 cm^{-1}, 1113.24 cm^{-1}, 1735.95 cm^{-1}, 2912.74 cm^{-1}, and 3250.03 cm^{-1} exhibited that the extracted polymer was PHAs. TGA analysis confirmed that recovered PHA polymer was stable below 240°C. The recovered polymer's surface topography was studied by scanning electron microscopy.