Effective cultivation of Scenedesmus acuminatus under mixotrophic cultivation mode

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The purpose of this study was to investigate the optimum conditions of several factors for maximizing the mixotrophic cultivation of Scenedesmus acuminatus using acetate as an organic carbon source. When acetate was used, dissolved oxygen (DO) was quickly consumed and resulted in an anoxic condition for 52 hrs. Then, DO increased quickly by photosynthetic reaction. Whenever we put acetate in a reactor after DO was recovered to higher than 7 mg/L, cells were quickly grown via cells respiration, which subsequently resulted in an anoxic condition. Compared to aeration, ammonium acetate, ammonium acetate with aeration tests, the highest maximum biomass productivity of 0.73 g/L/d was obtained for pH control test with ammonium acetate dosage. From this study, we found that DO was essential for the fast assimilation of acetate and depleted DO was quickly regenerated for pH control test. From this fact, we found that pH control test with ammonium acetate dosage was the best cultivation method for Scenedesmus acuminatus under mixotrophic condition. These findings could be useful reference for maximizing the cultivation of S. acuminatus in industrial-scale applications.