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## Mixotrophic Cultures of *Spirulina platensis*: Potential Production of Biomass, Metabolites and Pigments

Z. Rasouli<sup>1</sup>, \*M. Parsa<sup>2</sup> and H. Ahmadzadeh<sup>3</sup>

<sup>1</sup>Ph.D. Student, Dept. of Agronomy, Faculty of Agriculture, Ferdowsi University of Mashhad, Iran,

<sup>2</sup>Professor, Dept. of Agronomy, Faculty of Agriculture, Ferdowsi University of Mashhad, Iran,

<sup>3</sup>Professor, Dept. of Chemistry, Faculty of Sciences, Ferdowsi University of Mashhad, Iran

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### Abstract

*Spirulina platensis* has recently been identified as an important crop in the world, although its introduction and cultivation in Iran are still at an early stage. In this regard, autotrophic (without glucose) and mixotrophic cultures were performed in 0, 0.5, 1, 1.5, 2, 3, 4, 6, 10, 20 g l<sup>-1</sup> glucose at Ferdowsi University of Mashhad. The manipulation of the environmental conditions from autotrophy to mixotrophy caused changes in the chemical composition of the cells due to changes in the orientation of carbon allocation into proteins, carbohydrates and lipids. As the application of 0.5 g l<sup>-1</sup> of glucose via mixotrophic condition increased dry weight, cell concentration, protein, carbohydrate, chlorophyll, flavonoids, anthocyanin and phycoerythrin by 102.50, 106.06, 102.79, 141.38, 101.11, 129.82, 196.77 and 112.35 percent relative to the autotrophic culture. Mixotrophic cultures of 6 and 4 g l<sup>-1</sup> glucose enhanced the carbohydrate concentration by 337.93 and 317.24 percent in compare with autotrophic culture. On the other side, autotrophy was more effective on increasing the production of lipids, phycocyanin and allophycocyanin. Overall, a change in the formulation of the common culture media, and the addition of 0.5 g l<sup>-1</sup> of glucose is recommended to increase the efficiency of culture and ingredients amounts.

**Keywords:** Glucose, Mixotroph, Phycobiliproteins, Pigments, Protein