



Evaluation of the nutritional value of the cyanobacterium *Spirulina platensis* cultivated on wastewater from a recirculating aquaculture system

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Abstract

The increasing demand for alternative sources of safe and efficient vegetable proteins and the development of sustainable solutions for the valorization of aquaculture wastewater stimulate the interest in the use of the cyanobacterium *Spirulina platensis* as a biomass with high nutritional value. The present study is based on the evaluation of the nutritional potential of *Spirulina platensis* biomass cultivated on wastewater from recirculating aquaculture systems at the Research and Development Station for Aquaculture and Aquatic Ecology Iasi of the "Alexandru Ioan Cuza" University of Iasi. The algae were cultivated on the standard nutrient medium (Zarrouk) in a proportion of 90%, supplemented with 10% wastewater from the recirculating aquaculture system. During the exponential growth phase of the cyanobacterium, the general biochemical content of the biomass and the amino acid profile were determined (using classical spectrophotometric and chromatographic methods). The results showed that the *Spirulina platensis* biomass has a high protein content, constituting 53.94%, while carbohydrates represented 13.50% and lipids 7.30%. Amino acid analysis revealed the presence of a diverse spectrum of amino acids, with high values for glutamic acid (11.59%), leucine (6.70%), arginine (5.90%), aspartic acid (5.79%) and alanine (5.51%). The biomass also contained essential amino acids such as threonine, valine, isoleucine, leucine, lysine, methionine and phenylalanine, with values that did not differ significantly from those obtained in the case of cultivation of the algae on standard nutrient medium. Cultivation of *Spirulina platensis* on aquaculture wastewater represents a promising approach for obtaining an alternative source of biomass with a significant content of biologically active substances, simultaneously contributing to the valorization of nutrients from water and the development of circular technologies in the agri-food sector. The results obtained confirm the potential of this biomass for applications in aquatic animal nutrition (wastewater generating fish), biotechnology and sustainable valorization of aquatic resources.

Keywords: *Spirulina platensis*, biomass, nutritional value, aquaculture wastewater

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