Physiological investigations of diazotrophic cyanobacteria cultivated in chemostat photobioreactors: Improvement of biomass productivity

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Besides potential applications in the agriculture field as natural nitrogen fertilizer, N₂-fixing cyanobacteria have recently gained some attentions for new applications linked to the potential production of biologically active molecules or small molecules such as hydrogen or ammonium for alga fuels. However, few data are available on cultivation of heterocytous biomass production under photoautotrophic conditions within culture medium deprived of combined nitrogen. The aim of this research was to investigate kinetic and yield parameters for biomass production by heterocytous cyanobacteria cultures in laboratory photobioreactors. The Anabaena variabilis strain PCC 7937 was studied using continuous cultures for analyzing the biomass productivity as a function of the dilution rate. Then we took advantage of chemostat cultures at a fixed dilution rate for determination of the relation between culture performances at steady-state and some environmental parameters. Optimal pH of 6.5 was determined for biomass production under N₂. The experimental data confirmed that biomass productivity can be improved by increasing gas transfer efficiency and dissolved inorganic carbon concentration.

Biography
Wenli Kang has completed her Bachelor’s study from China Agriculture University and obtained her Master’s degree from Beihang University. She is a PhD student of Nantes University supported by China Scholarship Council (CSC), and works in the laboratory GEPEA (GEnie des Procédés Environnement - Agroalimentaire) UMR CNRS 6144. She will finish her PhD study in September 2016.