Using microalgae-bacteria (MaB) flocs to treat municipal wastewater and use of the biomass for biogas production

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Abstract:
Rise of human population causes an increase of freshwater use and wastewater production worldwide. Wastewater contains various pathogens injurious to health and nutrients (mainly N and P) which would support photosynthesis of chlorophytes and terrestrial plants but can be also an ecological threat to the environment. The conventional wastewater treatment plants (WWTP) require a large amount of energy (for mechanical aeration) and causes emission of CO2 and secondary contamination (by use of flocculants). Microalgae-Bacteria (MaB) biocoenosis can improve the capacity of the treatment system by simultaneous removal of the nutrients and carbon from wastewater with minimum carbon footprint and energy demands. In our research, the microalgae from a WWTP in Hamburg, Germany were collected, isolated, identified and used to inoculate municipal wastewater to assess the nutrients removal and biomass productivity of each strain.

BIO:
I pursued my studies in civil engineering in bachelor level in Yazd University (graduate 2007). I received my master's degree in Sustainable Water Management from Kristianstad University, Sweden in 2012. My master thesis is about considering human urine as nutrients resource for cultivation of microalgae Scenedesmus quadricauda for biodiesel production. After graduation, I have worked as a research assistant at the Swedish University of Agricultural Science (SLU) in 2013, focusing on nutrients removal capacity of indigenous microalgae in north of Sweden and their potential for biomass and lipids accumulation along with utilization of flue gases from local power plant. I moved to Germany after receiving a scholarship award in Sustainable Water Management (NaWaM) from German Academic Exchange Service (DAAD) and German Federal Ministry of Education and Research (BMBF) in September 2013. I started working at Hamburg University of Technology in 2014 as researcher after 4 months of German language courses. Now, I am pursuing my doctorate studies at University of Hamburg since April 2015, concentration on municipal wastewater treatment using isolated green microalgae integrated with sustainable bio-processing of the biomass for biogas production.