

A Practical Method to Improve Microalgal Biomass and Hydrogen Production in Mass Culture

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Unicellular microalgae hold the promise of commercial exploitation in mass culture for hydrogen and biomass production. Microalgal mass cultures growing under full sunlight have a low per chlorophyll (Chl) productivity. Up to 80% of absorbed photons could thus be wasted, reducing light conversion efficiencies and cellular productivity to fairly low levels. This shortcoming could possibly be alleviated by the development of microalgal strains with a limited number of Chl molecules in the light-harvesting antenna of their photosystems. The method of choice employed DNA insertional and chemical mutagenesis of the unicellular green algae, followed by a rigorous screening protocol to identify mutants with a smaller light-harvesting Chl antenna size. Molecular and genetic analyses of isolated mutant strains were characterized strains were characterized. Biochemical and physiological analyses in terms of photosynthetic productivity and light conversion efficiencies will be presented.