Various Techniques of Quantitative Measurements of Algal Biomass along with Statistical Correlations

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Algae is an alternative feed stock for biofuels, high value chemicals, and antioxidants. Sustainability of biofuel production directly depends on the growth and biomass productivity of algae species. The growth of algae is measured by many ways such as dry weight (DW), ash free dry weight (AFDW), optical density (OD), algae cell count (ACC) and total organic carbon (TOC). DW & AFDW are the gravimetric based approaches involving multiple steps such as filtration, washing, drying & ashing, which are laborious, time consuming, and also expensive. Therefore, to reduce the time and expense multiple alternative approaches were evaluated. The correlations between AFDW versus other methods were investigated. Linearity between the methods was determined and conversion factors were derived to calculate the AFDW from various growth parameters. In this study, algal cultures of different genera, namely *Picochlorum sp*., *Chlorella sp*. and *Scendesmus sp*. were selected to study the measurement accuracy of respective methods. Cultures were grown under controlled conditions, the growth was measured in terms of OD, ACC, AFDW and TOC. The correlation curves developed between AFDW versus various growth parameters, shown > 99% linearity. The slope derived, could be used to calculate AFDW instantly. The slope determined was found to be species specific. Amongst, all the studied methods OD, TOC and ACC were found 60, 20 and 10 times faster as well as 40, 6 and 10 times cheaper than AFDW method respectively. AFDW is laborious method whereas OD, TOC, and AAC are instrument based and require 50% lesser manpower. This study helped in evaluating appropriate alternative methods that provide quicker, convenient, accurate and economic biomass measurement procedures.

Biography:

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