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A comparative pyrolysis of microalgae *botryococcus braunii*, *spirulina sp*, and *chlorella sp*

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The microalgae, *Botryococcus braunii*, *Chlorella sp.*, and *Spirulina sp.*, have been reprinted as future sources of biofuel due to its concentrations of hydrocarbons and potential for oil production. The three algae underwent pyrolysis in a fixed-bed reactor, a process in which the algae were thermally decomposed, and then oil quantities were compared. The fuel quality of each different algae yield may vary depending on both the biochemical compositions of the strains as well as their response to the pyrolysis reaction. *Chlorella sp.* and *Spirulina sp.* powders were obtained from a commercial source whereas *Botryococcus braunii* samples were grown using a modified Bristol Medium at a concentration of 0.02%, room temperature, and humidity, 350 foot-candle light intensity, and a photoperiod of 16/8h light/dark cycle. The *Botryococcus braunii* feedstock was cultured, harvested, and dried at 60°C for 24h to produce a powdered feedstock. Preliminary results from the pilot study indicated that 5mg of *Chlorella sp.* can produce approximately 2mg of biofuel. However, the other two algal samples were too small to record an accurate result. Presently a second study is in place to more accurately compare the biofuel yields. Thirty 5g samples of each algae will be pyrolyzed and run through an HPLC to determine precise yields for biofuel. Since *Spirulina sp.* is 8% fat (USDA, 2016), *Chlorella sp.* is 22.5% fat and *Botryococcus braunii* is 34.9% fat (GH et al, 2014), it is expected that the *Botryococcus braunii* will produce the greatest amount of useable biofuel.

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