

Calorific Potential of Seven Marine Microalgae

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The calorific potential (CP) of seven microalgae strains from the Marine Microorganisms Collection of the Instituto Oceanográfico of Universidade de São Paulo were tested to assess their potential use for energetic purposes. The species tested were the diatoms: *Biddulphia* sp; *Odontella rhombus*; *Thalassiosira* sp, *Thalassiosira fluviatilis*, *Thalassiosira pseudonana* and the flagellates *Nannochloropsis gaditana* and *Chlorella minutissima*. The cultures grew in Guillard f/2 autotrophic batch systems, kept at 20°C, under cycles of 12h light and 12h dark. The growth was monitored by daily determination of cell density. When cells reach the stationary phase, biomass was collected by vacuum filtration and washed with ammonium formate (0.65M). The biomass was transferred to tubes and frozen previously to the lyophilization. Dry weight was determined by gravimetric analysis. The CP was determined in calorimetric pumps following ASTM D 2015-00 recommendation. Results of lower heating value (in MJ/kg relative to the dry weight) for each microalgae tested were: *Biddulphia* sp = 6.3; *O. rhombus* = 4.0; *Thalassiosira* sp = 3.9; *T. fluviatilis* = 10.3; *T. pseudonana* = 12.5; *N. gaditana* = 13.7 and *C. minutissima* = 6.7. As a reference value, the wood (which contains 51.6% of mass is carbon) has an average PC of 18.6 MJ/kg. These results indicate that, even considering a single genus (*Thalassiosira*, in this case), great differences in the PC can exist among the species. According to these data, the biomass of the microalgae *T. fluviatilis*, *T. pseudonana* and *N. gaditana* are able to be used as energy source.

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