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Experimental and Modelling of *Arthrospira platensis* Cultivation in Open Raceway Ponds

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Abstract

In this study, the growth of *Arthrospira platensis* was studied in an open raceway pond. Furthermore, dynamic models for algae growth and CFD modelling of hydrodynamics in open raceway pond were developed. The dynamic behaviour of the algal system was developed by solving mass balance equations of various components, with considering light intensity and gas-liquid mass transfer. A CFD modelling of the hydrodynamics of open raceway pond was developed by solving mass and momentum balance equations of the liquid medium. The prediction of algae concentration from the dynamic model was compared with the experimental data. The hydrodynamic behaviour of the open raceway pond was compared with the literature data for model validation. The model predictions match the experimental findings. Furthermore, the hydrodynamic behaviour and residence time distribution in our small raceway pond were predicted. These models can serve as a tool to assess the pond performance criteria.

Keywords: Biofuels, Dynamic modelling, CFD modelling, *Arthrospira platensis*, Open Raceway Ponds

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