

The prospects of the cultivation of *Arthrospira platensis* under outdoor conditions in Malaysia

ABSTRACT

There is no virtual report on the commercial cultivation of *Arthrospira* in Malaysia beyond the laboratory scale probably because of the high costs of production and the lower yield which are highly interconnected with the algal cultivation techniques. One way to alleviate the production cost is through outdoor mass cultivation under natural conditions using all available resources. Therefore, the present study was conducted to investigate the prospects of the production of *Arthrospira platensis* under Malaysian tropical climate using enhanced cultivation techniques to reach a maximum yield. In this study, the growth and yield of *A. platensis* were investigated under three different cultivation conditions: laboratory (control), outdoor shaded (greenhouse, T1), and outdoor non-shaded (field, T2). The algal growth was measured through optical density, biomass dry weight, and chlorophyll a content. The algal yield was determined by calculating its productivity and specific growth rate. The *A. platensis* cultivation under outdoor non-shaded conditions achieved significantly higher growth ($p < 0.05$) with 1.62 ± 0.038 ABS of maximum optical density, 0.88 ± 0.020 g L⁻¹ of maximum biomass dry weight, 8.77 ± 0.219 mg L⁻¹ of maximum chlorophyll a content, 0.091 ± 0.0022 g L⁻¹ d⁻¹ of productivity and 0.220 ± 0.0017 μ d⁻¹ of specific growth rate over a cultivation period of eight days. The present finding showed that the Malaysian climate is suitable for a satisfactory *A. platensis* productivity with proper cultivation techniques such as the pre-adaptation of the algal culture, inoculation in the late evening, continuous agitation and compensation of the evaporated culture medium.

Keyword: *Arthrospira platensis*; Biomass production; Outdoor cultivation; Cultivation techniques; Tropical climate