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Protein and toxin profiling at different growth phases of *A. tamiyavanichii* and *A. leei* (Conference Paper)

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Abstract

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The naturally occurring phenomenon of harmful algae blooming (HAB) at the water column brought detrimental effects to the economy as well as the environmental health of the water ecosystem. Most cases of HABs reported in Malaysia waters are dominated by dinoflagellates *Alexandrium* spp. In this study, *A. tamiyavanichii* and *A. leei* with different toxicity levels were analyzed using two-dimensional PAGE and HPLC analysis. The growth pattern of both species was identified and compared by using proteomic approaches at each growth phases. Protein expression reduced throughout the growth phases of *A. tamiyavanichii* but elevated during stationary phase of *A. leei*. A short duration of stationary phase suggests the continuous expression of growth proteins in *A. leei*. GNAT family acetyltransferase and lipases were successfully identified enzyme protein in *A. tamiyavanichii* and *A. leei* respectively with growth regulatory functions. The toxin profiles of both species exhibited a higher level of toxin content in *A. tamiyavanichii* with 88 mol % of total toxins recorded as compared to 12 mol% in *A. leei*. The highest toxin content was recorded during the exponential phase of *A. tamiyavanichii* with a dominance of GTX4 and STX congeners. Fundamental studies of dinoflagellates from its molecular as well as byproduct analysis are useful to understand the biochemistry of the HAB species. The findings from this study can provide the basic knowledge on the biochemical properties of HAB species and the behavioral of affected organisms. © 2019 Association for Computing Machinery.

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