

INAUGURAL LECTURE

**The Versatile
Algae**
*An Organism
of the Future*

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*An Organism
of the Future*

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ABSTRACT

Algae are very simple, photosynthetic organisms ranging in size from microscopic unicellular forms to large seaweeds. They are an incredible primitive life form that can thrive almost anywhere. While their mechanism of photosynthesis is similar to that of higher plants, they are generally more efficient converters of solar energy due to their simple cellular structure. For its structural and functional simplicity, the algae have become a versatile model organism. This lecture describes the multifaceted uses of algae in providing solutions to various problems. In water resource management, algae are reliable bioindicators of river water quality, where local species were identified and found to inhabit only pristine or polluted waters. Studies on the relationships between phytoplankton and its fluctuating environment in Pansoon Reservoir and Kenyir Dam have resulted in an understanding of the main driving forces behind temporal and spatial patterns of its existence in lakes and reservoirs. *Cochlodinium polikrikoides* and *Pyrodinium bahamense var compressum* are two causative dinoflagellates of harmful algal blooms (HAB) in Sabah, with the latter producing algal toxins. Researches on HAB are concerned with understanding factors triggering bloom initiation for the management and control of red tides and characterization of algal toxins for the development of a biosensor for rapid identification of the toxin-producing species. A molecular approach to the study of algae is taken to understand biogeographical distribution and dispersion of the species, to determine phylogenetic relationships between similar strains, to develop a species-specific molecular probe for rapid identification and for varietal identification of the commercial seaweed *Eucheuma* spp. Future uses include harvesting algae for biofuel and for the isolation of novel compounds.

