

Ribosomal DNA analysis of marine microbes associated with toxin-producing *Pyrodinium bahamense* var. *compressum*, a harmful algal bloom species

Abstract

Blooms of the toxic alga, *Pyrodinium bahamense* var. *compressum* (Böhm), have become a problem in Malaysia over the past three decades. The alga is a causative agent of paralytic shellfish poisoning, a potentially fatal neurological disorder. Past research suggest that bacteria-algae association may play a direct or indirect role in toxin production. As such, ribosomal DNA-based restriction enzyme analysis for the identification of bacteria associated with *Pyrodinium* spp. was undertaken. A total of 16 bacterial isolates were successfully obtained from the clonal cultures of *Pyrodinium* spp. The diversity of the extracellular bacteria associated with *Pyrodinium bahamense* var. *compressum* was limited to the Phyla Proteobacteria and Actinobacteria. The major bacterial species identified included *Alcanivorax* spp. and *Hyphomonas* spp., whereas *Kocuria* spp., *Nesterenkonia* spp., *Alteromonas* spp., *Roseobacter* spp., *Xanthomonas* spp., and *Acinetobacter* spp. were identified as minor isolates. The identified bacterium *Hyphomonas* spp. exhibited high sequence identity with an unknown bacterium strain, SCRIPPS 739, in the GenBank database that is known to be associated with toxic and non-toxic dinoflagellates, *Alexandrium* spp. and *Scrippsiella trochoidea*, respectively.