



PHYLOGENETIC RELATIONSHIPS BETWEEN *PROROCENTRUM* AND *DINOPHYSIS*, TWO POTENTIAL DIARRHETIC SHELLFISH POISON (DSP)-PRODUCING DINOFLAGELLATES, BASED ON ULTRASTRUCTURE AND MITOCHONDRIAL b (FRG0101-NSNH-1/2007)

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SYNOPSIS

This study was carried out to investigate the morphological relationship between *Prorocentrum* and *Dinophysis*, and to identify other characteristics (morphology and new gene-cytochrome b) to improve the classification of *Prorocentrum*. To achieve these objectives ultrastructural study (SEM and TEM) were carried out on *D. acuminata* and *P. hoffmaniannum*. Results showed that *Dinophysis* has 4 platelets surrounding the flagellar pore as has been suggested in study elsewhere. *Prorocentrum hoffmaniannum* has 8 platelets in the periflagellar area and SEM is not suitable to determine the number of platelets for *Prorocentrum* species. The relationship between these two genera based on platelets configuration cannot be resolved until more *Dinophysis* species have been studied. Prior to molecular analysis, the morphology characteristics of six *Prorocentrum* species were identified using light and SEM. The morphological characteristic of these *Prorocentrum* species agreed well with previous descriptions. *Prorocentrum norrisianum* identified in this study is similar morphologically to *P. cassubicum*. Phylogenetic study based on cytochrome b on 9 species of *Prorocentrum* and 14 other dinoflagellates showed that Prorocentroids is monophyletic as suggested morphologically. The Prorocentroid can be divided into 4 groups based on combination morphological characteristics and toxin production. Ecology study showed that *Prorocentrum* preferred seagrasses rather than seaweed and sand.

SINOPSIS

Kajian ini dijalankan untuk mengkaji hubungan morfologi di antara *Prorocentrum* dan *Dinophysis* dan untuk mengenalpasti ciri-ciri lain (morfologi dan gen baru – sitokrom b) untuk memperbaiki pengkelasan *Prorocentrum*. Bagi memenuhi objektif ini, kajian ultrastruktur (SEM dan TEM) telah dijalankan ke atas *D. acuminata* dan *P. hoffmanianum*. Keputusan kajian menemui 4 plat mengelilingi lubang flagella pada *D. acuminata* iaitu seperti yang telah dilaporkan. *Prorocentrum hoffmanianum* mempunyai 8 plat pada kawasan periflagela dan SEM tidak sesuai digunakan untuk menentukan bilangan plat pada species *Prorocentrum*. Hubungan di antara kedua-dua genera ini tidak dapat diselesaikan sehingga lebih banyak *Dinophysis* dikaji. Kajian morfologi ke atas 6 species *Prorocentrum* telah dijalankan menggunakan SEM dan TEM. Morfologi species-species ini menyamai dengan deskripsi terdahulu. Kajian filogenetik menggunakan sitokrom b ke atas 9 species *Prorocentrum* dan 14 species dinoflagellates lain menunjukkan Prorocentroids adalah monofilatik seperti yang dicadangkan berdasarkan morfologi. Prorocentroids boleh dibahagikan kepada 4 kumpulan berdasarkan kombinasi ciri morfologi dan penghasilan toksin. Kajian ekologi menunjukkan *Prorocentrum* menyukai rumput laut berbanding dengan rumpai laut dan pasir.