

CHAPTER I

INTRODUCTION

Noctiluca scintillans (Ehrenberg) McCartney is a heterotrophic dinoflagellate that inhabits the world oceans and occasionally causes red tides. It is a large cell (500–1000 μ m diameter) that floats with the current and cannot actively swim. *N. scintillans* is a bioluminescent organism that is usually responsible for the blue-green luminescence seen on wave crests at night. This bloom-forming species is associated with fish and marine invertebrate mortality events (Fukuda and Endoh, 2006).

N. scintillans red tides frequently form in spring and summer in many parts of the world often resulting in a strong pinkish red or orange discoloration of the water (tomato-soup) (Hallegraeff 1991, Huang and Qi 1997) but it is green discoloration in Southeast Asian water due to the green color of its symbiont, *Pedinomonas notilucea*. Spectacular blooms result from an interaction of biological features (vertical position regulation) and physical concentration mechanisms (currents, upwelling, fronts) (surface slicks can be rapidly mixed away by the wind). High concentrations of their plankton food source that likely result from environmental conditions such as well-mixed nutrient-rich waters and seasonal circulation factors are implicated in population blooms of *N. scintillans*, known as “red tides”. Runoff from agricultural pollution may contribute to the severity of these blooms, but is not required to cause such events of explosive population growth.

In the inner Gulf of Thailand, *N. scintillans* is the main causative red tide organism and the bloom of this species takes place throughout the year and is frequently observed from July to September in the eastern part and from December to February in the western part of the inner Gulf of Thailand (Lirdwitayaprasit *et al.*, 1993). However, the relationship between groups of *N. scintillans* in the inner Gulf of Thailand has not been known and the knowledge of the cause of blooming or the distribution in this area still rare. Therefore, this study was conducted and aimed at the application of the molecular genetic technique for study genetic variation of *N. scintillans* in the inner Gulf of Thailand. The results obtained from this study may explain the distribution relationship among the different groups of green *N. scintillans* distributed in the inner Gulf of Thailand.