

Abstract:

**Study on effects of physical , biological and chemical parameters on growth and bloom-forming of
dinoflagellates *Cochlodinium polykrikoides***

The red tide, as a natural phenomenon, has been frequently occurred in the Persian Gulf and Oman Sea coastal waters. Harmful algal blooms of *Cochlodinium polykrikoides* were first observed in August 2007 and coincided with massive aquatic organisms' mortalities and have caused substantial economic losses and negative effects on the aquatic environment in the Persian Gulf. The objective of this study was to evaluate direct control or mitigation of *C. polykrikoides* blooms through physical (flocculation with clay; 0.5, 1.0, 1.5, 2, 4 and 10 g L⁻¹), biological [6 seaweeds; fresh and extract (aqueous and methanol)] and chemical (hydrogen peroxide, potassium permanganate, copper sulfate, acetic acid and sodium hypochlorite; 0.05, 0.1, 0.5, 1 and 1.5 g L⁻¹) treatments. The results of the physical assay showed that the growth of *C. polykrikoides* was strongly inhibited by using clay slurry in 4 or 10 g L⁻¹. The removal efficiency of *C. polykrikoides* by clay was 99% after 24 hour. The seaweeds showed the most mitigation effect on *C. polykrikoides* using aqueous extract was *C. sinuosa*, using mixed aqueous and methanol were *S. illicifolium* , *U. lactuca* and *G. corticata*, fresh tissue were *E. intistialis* , *C. sinuosa* , *H. valentia* , and culture filtrate of *E. intistialis*. The results clearly showed that the flocculants; potassium permanganate, copper sulfate, acetic acid and sodium hypochlorite had the highest removal efficiency (100%) of *C. polykrikoides* cells in the lowest concentration (0.05 g L⁻¹). Overall, our experiments suggest that using clay and seaweeds as a control strategies could be considered for HABs in the Persian Gulf coastal waters.

Key words: Harmful algal bloom, *Cochlodinium polykrikoides*, Isolation, Optimum growth parameters, Persian Gulf