

**THE COMMUNITY COMPOSITION AND
PRODUCTION OF PHYTOPLANKTON IN FISH PENS OF
CAPE BOLINAO, PANGASINAN**

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PRODUCTION OF PHYTOPLANKTON IN FISH PENS OF
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by

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*The community composition and production
of phytoplankton in fish pens of Cape
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ABSTRACT

The last five years saw the proliferation of fish pens in Cape Bolinao, Pangasinan, NW Philippines to about 1,170 pens and cages in approximately 5-6 km² in area in 2000. Ranges of 3-16 sacks of feeds per day have been used per pen that measures 5 x 6m². In recent years, fish kills and phytoplankton blooms have occurred in the area.

This study wanted to ascertain if fish pens alter phytoplankton community composition and production in coastal Bolinao.

Previous collection of phytoplankton samples from sites outside the fish pens during 1998-2000 were analyzed. During the wet, dry, and transition period of 2001, phytoplankton samples were taken from inside and outside of the pens and in the control station devoid of pens daily for seven days. A microcosm experiment was also done with 14 carbouys (13L capacity transparent plastic containers) suspended in the water column inside and outside the fish pens and in the control station for 7 days. Carbouys inside the pens were enriched with feed following the same kind and proportion of feed received by a fish pen in a day. The other carbouys had no feed added. Sampling strategy for the microcosms was the same as the field experiment. Chlorophyll-a and other physico-chemical parameters were measured.

The 1998-2000 samples were diatom dominated. During the 2001 wet season, the dinoflagellate *Ceratium furca* were found to be dominant and high counts of 10⁴ cells/L were recorded. In the transition period, the dinoflagellates *Protoperdinium* sp., the diatoms *Cylindrotheca closterium* (*Nitzschia closterium*) and *Leptocylindricus* sp. were the most abundant. In the 2001 dry season, the diatom *Cylindrotheca closterium* reached 10⁵ cells/L when dissolved oxygen was 0.70-2.30 mg/L and there were sightings of isolated fish kills.

The diatoms (10⁵ cells/L) and more so the cyanobacteria (10⁵-10⁶ cells/L) bloomed inside the feed enriched microcosms. There is a possibility that Bolinao waters could experience blooms of cyanobacteria similar to those found in the microcosms. This could occur in extreme cases where water flushing becomes almost nil for at least 4-7 days.

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The community composition and production of phytoplankton in fish pens of Cape Bolinao, Pangasinan.

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STATEMENT OF THE PROBLEM

Aquaculture is an answer to food shortage especially in third world countries. However, this can degrade the environment. Production of large amounts of waste material derived from unconsumed feed inputs and animal feces raise levels of inorganic and organic matter discharged into coastal waters (Iversen, 1996). This leads to eutrophication, deterioration of water quality, and causes changes in phytoplankton community composition (Alberto et al., 1998, Chua et al., 1989).

This study determined the present condition of phytoplankton in fish pens of Cape Bolinao, Pangasinan in terms of its community composition and production.

SIGNIFICANCE OF THE STUDY

The demand for food especially in third world countries increases with the continuous growth of population. This has challenged many leaders. Several solutions have been tried from drastically curbing the increase in human population to increasing food production. The balance of conservation and exploitation of resources remains a problem.

Asia dominates global aquaculture production (Kongkeo, 2000). In 1997, Asia's production was 33 million metric tons, which is 90 % of the total world pro-