

## PRELIMINARY STUDY ON CYANOBACTERIA COMPOSITION AND SELECTED WATER QUALITY PARAMETERS FROM FRESHWATER FISH (*Tor tambroides*) PONDS IN SERIAN, SARAWAK.

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### ABSTRACT

Toxic cyanobacteria, for example, species from the genera *Microcystis*, *Anabaena* and *Oscillatoria* may present risk of cyanotoxin bioaccumulation in fish tissues either directly or via other organisms in the food web, consequently posing hazard to aquatic animals and humans. A study was conducted to determine cyanobacterial species composition and their relationships with selected water quality parameters. Water samples were collected from subsurface of two *Tor tambroides* (locally known as empurau) aquaculture ponds in Serian District, Sarawak from January to June 2007. There were 35 cyanobacterial species recorded from 11 genera of four families. Common occurrence of *Chroococcus*, *Nostoc*, *Oscillatoria*, *Pleurocapsa* and *Synechocystis* genera were observed in both ponds. In Pond P12, visible brownish bloom which consists of *Microcystis* and *Anabaena* were observed. The correlation co-efficient analysis in Pond AP22 showed that cyanobacterial cell density has significant positive correlation with biological oxygen demand ( $r = 0.839$ ,  $p < 0.01$ ). Chlorophyll *a* concentration showed significant positive correlation with turbidity in both ponds ( $r = 0.861$ ,  $r < 0.01$  in Pond AP22 and  $r = 0.849$ ,  $p < 0.01$  in Pond P12). Further research should be carried out to determine the presence of cyanotoxin in those aquaculture ponds.

*Key words:* cyanobacteria, *Tor tambroides*, water quality, species composition

### INTRODUCTION

*Tor tambroides* (also known as empurau) are considered valuable fish which has significant cultural and economic importance in Sarawak. This species are distributed throughout Southeast Asia from Indonesia to southern China (Roberts, 1999). In order to increase the producing potential of this species, Sarawak Government has established Indigenous Fisheries Research and Production Centre (IFRPC), Tarat, Serian in order to conduct the research related with *Tor* artificial propagation.

Many scientific reports (Chorus & Bartram, 1999; Wetzel, 2001) have shown the proliferation of cyanobacteria in water bodies as bloom is associated with enrichment with nutrient including nitrate, ammonium and phosphate. High concentration of these nutrients that are degradation products from organic waste and uneaten food during fish cultivation may promote the rapid growth of cyanobacteria (Kankaanpaa *et al.*, 2004).

Toxic cyanobacteria are found throughout the world and have potential to cause harm to animal and human health (Prommana *et al.*, 2006). The most frequently reported toxin-producing cyanobacterial genus is *Microcystis* (Botes *et al.*, 1982) which are capable of producing microcystins - a cyclic peptide hepatotoxins and tumor promoters.

The purpose of this study was to establish a baseline data of the freshwater cyanobacterial species especially in *Tor tambroides* cultivation ponds with the aim of contributing to risk assessment of potential cyanotoxin contamination of water and bioaccumulation in fishes.