

Toxicity Assessment of Cyanobacterial Strains Using Brine Shrimp and Mouse Bioassay

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ABSTRACT

Cyanobacterial samples were collected from aquaculture ponds in Sarawak and Sabah. Strain belonging to *Microcystis* sp. were isolated and maintained in laboratory cultures. Mass cultures were performed and the cells were harvested in their late exponential phase of growth. Each strain was lyophilized and extracted using methanol to get the crude extract. Five different concentrations were tested in brine shrimp assay and the extracts were toxic with a LC₅₀ of less than 50 µg/ml within 24 hrs observation. Mouse bioassay was done via intraperitoneal injection of 1.0 ml of a lysate of toxin extract into ±20 g white mice. The preliminary screening of toxin extracts using brine shrimp and mouse bioassay indicates that the strains are potentially toxin producer species and subjected to further examine using high performance liquid chromatography method.

Keywords: Brine shrimp, Mouse bioassay, *Cyanobacteria*, laboratory cultures.

INTRODUCTION

The blooms of toxin-producing cyanobacteria frequently observed in nutrient-rich water, termed as eutrophic condition (Falconer, 1993). Cyanobacterial toxins include a range of chemical compounds which potentially form a threat to humans, birds and various aquatic life (Kotak *et al.*, 1996). Microcystin is the common generic name given to the toxins produce by *Microcystis* species. On the basis of acute toxicity, Microcystin-LR is considered among the most potent hepatotoxins within the different variants and most often responsible for poisoning animals and humans who come into contact with toxic blooms (Funari and Testai, 2008).

Several methods are described for the analysis of cyanobacterial toxin, including physiochemical and biological procedures. Of the former, high performance liquid chromatography (HPLC) is the most widely used for the detection of toxin after some of the standards become available (Harada *et al.*, 1994). For the biological procedure, mouse bioassay via intraperitoneal injection (i.p.) of cyanobacterial extracts or purified toxins is the most commonly used bioassay (Falconer, 1993). Besides that, the brine shrimp *Artemia salina* also been used extensively for toxicity testing, and microcystins have been shown to be toxic to this organism (Campbell *et al.*, 1994). Thus the purpose of this study is to establish preliminary screening of cultured *Microcystis* toxin and to highlight the occurrence of potential toxin-producing cyanobacteria species in selected study area. Besides that, the

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