

NOTICE OF PUBLICATION



AQUACULTURE & FISHERIES INNOVATION LAB

RESEARCH REPORTS

Sustainable Aquaculture for a Secure Future

Title: Evidence of rapid transfer and bioaccumulation of Microcystin-LR poses potential risk to freshwater prawn *Macrobrachium rosenbergii* (de Man)

Author(s): Li-Ping Liu¹, Xiao-Ming Su¹, Tao-Ying Chen¹, Kang Li¹, Jia Zhan², Hillary Egna³, and James Diana⁴

1. Key Laboratory of Exploration and Utilization of Aquatic Genetic Resources, Shanghai Ocean University, Ministry of Education, Shanghai, China

2. Ningbo Entry-exit Inspection and Quarantine Bureau of P.R. China, Ningbo, China

3. AquaFish Innovation Lab, Oregon State University, Corvallis, Oregon, USA

4. School of Natural Resources and Environment, University of Michigan, Ann Arbor, Michigan, USA

Date: 14 April 2015

Publication Number: AquaFish Research Report 15-340

Abstract: AquaFish will not be distributing this publication. Copies may be obtained by writing to the authors.

Microcystins accumulate in aquatic organisms and can be transferred to higher trophic levels, eventually affecting vector animals and consumers. We examined three levels of an aquatic food chain (*Microcystis aeruginosa*, *Daphnia magna* and *Macrobrachium rosenbergii*) to identify the transfer efficiency and risk of microcystin on prawns. Samples were analysed using ultra performance liquid chromatography-mass spectrometry (MS)/MS and microcystin-LR (MC-LR) distributions in prawn tissues were studied. The results showed that prawns accumulate MC-LR both directly from *M. aeruginosa* and indirectly through *D. magna* which was pre-exposed to *M. aeruginosa*. MC-LR was detected in the gills, digestive tracts and hepatopancreas of the prawns 2 h. after exposure. MC-LR accumulated in prawns to 0.49 +/- 0.04 $\mu\text{g g}^{-1}$ dry weight in hepatopancreas within 24 h, while it was not detected in muscle samples, and rarely appeared in blood samples in such a short period. Although MC-LR was not detected in muscle, the head including hepatopancreas of the prawns accumulated troublesome amounts of MC-LR. These results demonstrate that microcystis blooms in prawn farming potentially pose a risk to human consumers, although prawns may be exposed to the bloom for a very short time, hence regular monitoring of blue green algae population is recommended.

AQUAFISH RESEARCH REPORTS are published as occasional papers by the Management Entity, AquaFish Innovation Lab, Oregon State University, Corvallis, Oregon 97333-3971 USA. The AquaFish Innovation Lab is supported by the US Agency for International Development under Grant No. EPP-A-00-06-00012-00. See the website at <aquafishcrsp.oregonstate.edu>.

Continued...

This abstract was excerpted from the original paper, which was published in *Aquaculture Research* (2015). 1-10.

AQUAFISH RESEARCH REPORTS are published as occasional papers by the Management Entity, AquaFish Innovation Lab, Oregon State University, Corvallis, Oregon 97333-3971 USA. AquaFish is supported by the US Agency for International Development under Grant No. EPP-A-00-06-00012-00. See the website at <aquafishcrsp.oregonstate.edu>.