Narumol Klangkaew 2010: Pharmacokinetics and Residue Depletion of Oxytetracycline in Giant Freshwater Prawn (*Macrobrachium rosenbergii*). Master of Science (Veterinary Pharmacology and Toxicology), Major Field: Veterinary Pharmacology and Toxicology, Department of Pharmacology. Thesis Advisor: Associate Professor Amnart Poapolathep, Ph.D. 102 pages.

The giant freshwater shrimp (*Macrobrachium rosenbergii*), a native species of Thailand, is the most popular freshwater shrimp for commercial cultivation. Freshwater shrimp farming is carried out to export the shrimp for commercial purpose or to supply for the local requirements in Thailand. With the increase in shrimp production, *M. rosenbergii* has become susceptible to various viral and bacterial diseases under adverse environmental conditions. Antibiotics are used to improve diseases control and treatment in shrimp farming. This raises the problems of tissue residues and evolving antimicrobial strains of bacteria in association with inappropriate dosages. Antimicrobial agents including broad spectrum antibiotics, such as oxytetracycline (OTC), are widely used to treat bacterial infections in fish and shrimp. The US Food and Drug Administration (FDA) approved three antibiotics, including OTC, for use in aquatic animals. The purpose of the present study was to investigate the hemolymph and muscle tissue kinetic of OTC in *M. rosenbergii* following either intramuscular (i.m.) or oral (p.o.) administration at two dosages of 11 and 22 mg/kg body weight (b.w.). In addition, the residue depletion patterns of OTC were examined after medicated-feed treatment at the feeding level of 4 g/kg of feed for 5 consecutive days. The concentration of OTC in hemolymph and muscle tissues of shrimp was mainly measured using a microbiological assay. Peak hemolymph concentrations (C_{max}) were 69.12 and 9.60 µg/ml at a single dose of 11 mg/kg b.w. whereas they were 125.5 and 23.5 µg/ml after i.m. and p.o. administration at a single dose of 22 mg/kg b.w., respectively. The elimination half-lives of OTC were 9.07 and 8.14 h at a dosage of 11 mg/kg b.w. but 11.47 and 9.97 h after i.m. and p.o. administration at a dosage of 22 mg/kg b.w., respectively. Peak muscle concentrations were 12.49 and 6.77 µg/g at a dosage of 11 mg/kg b.w. whereas they were 20.92 and 9.35 µg/g after i.m. and p.o. administration at a dosage of 22 mg/kg b.w., respectively. The elimination half-lives of OTC in muscle tissue of shrimp were 29.66 and 26.93 h at a dosage of 11 mg/kg b.w. but 31.58 and 27.85 h after i.m. and p.o. administration at a dosage of 22 mg/kg b.w., respectively. Taken together, the dose of 4 g/kg of feed for 5 consecutive days can be recommended for therapeutic dosage regimenin giant freshwater shrimp aquaculture. To avoid the OTC residue in shrimp muscle, it should take at least 8 days postcessation of medicate feed to wash out the drug from the muscle of *M. rosenbergii*

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