

Sumolrut Krapeedang 2006: Efficacy of Crude Herbal Extracts on Growth Inhibition of *Vibrio* spp. in Black Tiger Shrimp (*Penaeus monodon* Fabricius). Master of Science (Biotechnology),
Major Field: Biotechnology, Department of Biotechnology. Thesis Advisor:
Assistant Professor Penkhae Wanchaitanawong, Ph.D. 123 pages.
ISBN 974-16-2598-7

Crude ethanol extracts of 31 herbs were screened for growth inhibition of 10 strains of *Vibrio* spp. by the well assay method. Of these plants tested, crude ethanol extracts of five, namely *Terminalia chebula* Retz., *Caesalpinia sappan* Linn., *Phyllanthus amarus*, *Piper betle* L., *Plumbago indica* Linn. exhibited antimicrobial activity against more than 5 tested microorganism. Minimum inhibition concentrations (MICs) of the selected crude herbal extracts with various concentrations against *Vibrio harveyi* 02 were determined. MICs of *T. chebula*, *P. amarus*, *P. indica*, *C. sappan* and *P. betle* were 2.5, 2.5, 5.0, 10 and 20 % (ml/ml), respectively. MICs of *T. chebula* and *C. sappan* against *V. harveyi* 02 (10^4 cfu/ml) were also examined by the broth dilution method using NB+1.5 % NaCl and 1.5 % NaCl solution. The results showed that MICs of these two extracts were 0.625, 1.250 % (ml/ml) for NB+1.5 % NaCl and 0.010, 0.039 % (ml/ml) for 1.5 % NaCl, respectively. It was found that MICs also increased when concentration of *V. harveyi* 02 increased. In addition, the effect of different solvents (hexane, chloroform, ethyl acetate, methanol and water) on antimicrobial activity of the extracts was carried out. Methanol extract of *T. chebula* was found to be the most effective against test strains. Subsequently, the extract was fractionated by column chromatography and antimicrobial compound was analysed by high performance liquid chromatography as tannic acid. Furthermore, the extraction of *T. chebula* and *C. sappan* were investigated under various conditions, including temperatures and extraction times. It was found that the optimum conditions were 60°C for 48 hours for ethyl acetate, methanol, ethanol and water. Moreover, the effect of crude ethanol extracts of these two herbs on *V. harveyi* 02 resistance in black tiger shrimp was examined by feeding with 16.67 % and 33.33 % (ml/g) for 4 weeks before a challenge with *V. harveyi* 02 at 5×10^6 cfu/ml for 1 h infection. The results showed that the shrimps receiving herbal extracts had 80 % survival whereas the control showed only 20 % survival.

Student's signature

Thesis Advisor's signature