

EFFECTS OF AERATION AND CHEMICAL TREATMENTS  
ON NUTRIENT RELEASE AND ADSORPTION  
IN BOTTOM SOIL FROM SHRIMP POND

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by

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## ABSTRAK

Sistem air-tanah dalam makmal dibina dengan menggunakan tanah kolam air payau, air kolam dan akuarium yang berisipadu 12 L. Pengudaraan dibekalkan kepada akuarium yang mempunyai kepekatan oksigen yang tinggi. Manakala dalam akuarium yang mempunyai kepekatan oksigen yang rendah, pengudaraan tidak dibekalkan. Rawatan kimia yang diamalkan telah memberi kesan yang bererti pada pembebasan dan penyerapan nutrien oleh tanah kolam dalam keadaan dengan dan tanpa pengudaraan. Rawatan alum telah memberi galakan dalam penyerapan fosforus reaktif terlarut dalam keadaan tanpa pengudaraan. Selain daripada itu, alum juga menurunkan turbiditi dalam air kolam yang dibekalkan pengudaraan tanpa meningkatkan pH dalam air payau. Rawatan kalsium karbonat telah memberi galakan dalam penyerapan fosforus reaktif terlarut dalam keadaan tanpa pengudaraan. Tambahan pula, jumlah alkaliniti juga ditingkatkan dalam keadaan dengan atau tanpa pengudaraan di bawah rawatan kalsium karbonat. Rawatan natrium nitrat hanya menggalakan pembebasan nitrit dalam keadaan dengan pengudaraan. Rawatan natrium asetat yang mewakili input organik semasa penkulturan telah memberi galakan dalam pembebasan fosforus reaktif terlarut dalam keadaan tanpa pengudaraan; pembebasan jumlah amonia dalam keadaan dengan atau tanpa pengudaraan; pembebasan nitrit dalam keadaan dengan pengudaraan dan penyerapan nitrit dalam keadaan tanpa pengudaraan; penyerapan nitrat dalam keadaan dengan atau tanpa pengudaraan.

## ABSTRACT

Laboratory soil-water systems were set up by using shrimp pond bottom soil, pond water and 12 L aquaria. Aeration was provided to the high oxygen concentration aquaria. In the low oxygen concentration aquaria, no aeration was applied. Chemical treatments had presented significant effects on the nutrient release and adsorption in bottom soil under aerated and unaerated conditions. Alum treatment had enhanced the adsorption of SRP in unaerated systems. Besides that, alum also decreased the turbidity of pond water in aerated systems without increasing pH in brackishwater systems. Calcium carbonate treatment had enhance the adsorption of SRP in unaerated systems. In addition, total alkalinity was increased in aerated and unaerated systems under calcium carbonate application. Sodium nitrate treatment only enhance the release of nitrite-N in aerated systems. Sodium acetate treatment which represented the organic input during the culture period had enhanced the release of SRP in unaerated systems; release of total ammonia-N in aerated and unaerated systems; release of nitrite-N in aerated systems and adsorption of nitrite-N in unaerated systems; adsorption of nitrate-N in aerated and unaerated systems.