

[ENV07]

**The performance of the biological filter in removing the ammonia-nitrogen from the recirculating system of an intensive freshwater fishpond**

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A closed, recirculating freshwater culture system with biological filters was designed and been studied. The study was focusing on the performance of those biological filters in treating the reused water from the fish tanks in order to reduce the ammonia-nitrogen and other inorganic nitrogen compounds before recycle it back into the fish tanks. There were nine individual units and each unit has individual configuration. The units were 1) fish tank, 2) sedimentation tank, 3) clarifier tank, 4) sand filter, 5) trickling filter, 6) Denitrification filter, 7) oxygenation and degassing unit, 8) additional oxygen unit, and 9) reservoir (aged tap water, pre-aeration). Fish used were *Tilapia niloticus* and reared in a concrete tank with the initial density of 5 kg/m<sup>3</sup> or 57 fish/m<sup>3</sup> and had been reared until the final density became 25 – 30 kg/m<sup>3</sup> or 225 fish/m<sup>3</sup>, averagely in order to achieve intensive culturing. These units were constructed on an elevation with gravity force, to reduce the energy utilization on pumps, except at unavoidable places, in order to elevate water. From the data, it is obvious that the nutrients (NH<sub>3</sub>-N, NO<sub>2</sub>-N and NO<sub>2</sub>-N) had been reduced through trickling filter and sand filter at efficiency of 75.6% for NH<sub>3</sub>-N. The sand filter could reduce 74.07% of the TSS and simultaneously removed the un-ionised ammonia, and this was considered as very good. Finally, it could be concluded that the studied recirculating system technology is technically feasible and economically viable. This system showed that all the water quality parameters that should be reduced did lessen well under the acceptable limits of concentrations tolerated by the fish.