

# The Efficiency of *Avicennia marina* to Treat Wastewater from Shrimp Farm Effluent

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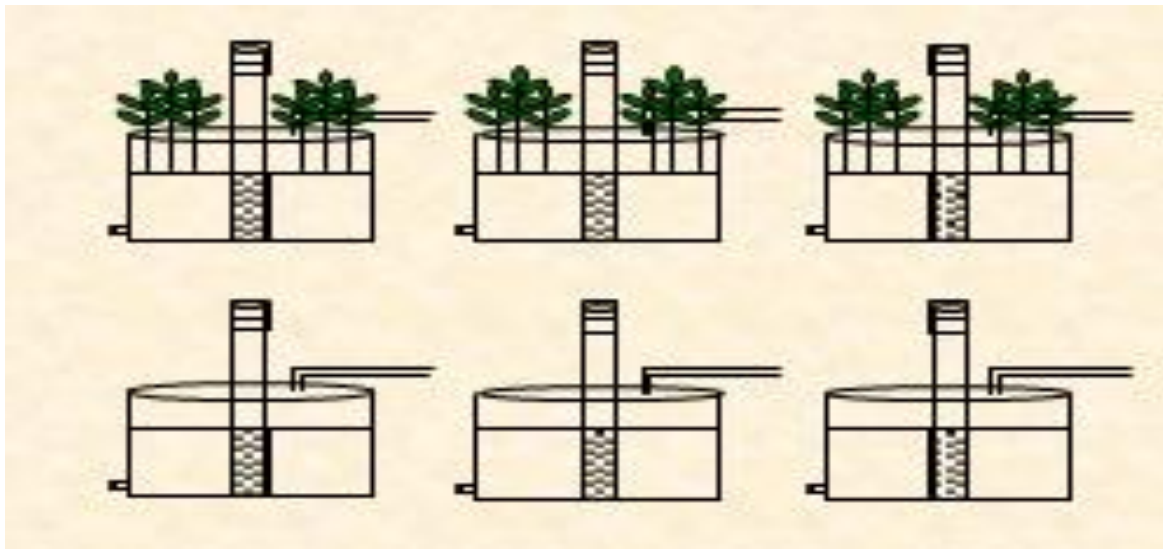
**Abstract:** The objective of this research was to study the efficiency of *Avicennia marina* for wastewater treatment of shrimp farm effluent was designed using 2 experimental groups (seawater and water effluent from shrimp farm). In each experiment, it was planted with *Avicennia marina* seeding and without seeding (as control units), for three replicates, making up 12 experiment units in total. Seawater and water effluent from shrimp farm were pumped into the systems and retained within the system for 7 days before discharging. The result indicated *Avicennia marina* could be treated water effluent from shrimp farm better than without plant experiment. The removal percentage of Total Suspended Solid, BOD, Ammonia-Nitrogen (NH<sub>4</sub><sup>+</sup>-N), Total Nitrogen and Total Phosphorus of *Avicennia marina* were 76.94–91.43%, 46.48–72.09%, 69.86 – 87.56%, 70.32 – 89.80% and 64.04 – 86.76%, respectively. Whereas the removal percentage in control units were 74.86 – 87.68%, 47.27 – 63.79%, 57.14 – 79.66%, 65.10 – 78.65% and 58.64 – 82.32%, respectively. The results suggested that *Avicennia marina* could improve the treatment efficiency in constructed wetland..

**Introduction:** The shrimp farming industry in Thailand has rapidly expanded. Consequentially, the uneaten feed and excreted waste have created a number of water quality problems. The wastewater from shrimp farming is responsible for nutrient enrichment in receiving waters. Conventional wastewater treatment systems are costly to install and operate, therefore, using construction wetland system is an interesting alternative. For these reasons, this research aimed to the study on efficiency of *Avicennia marina* seeding for nutrient and suspended solid treatment of shrimp farm effluent.

**Methodology :** 1. The experimental system was designed using 2 experimental groups (seawater and water effluent from shrimp farm). In each experiment, it was planted with *Avicennia marina* seeding and without seeding (as control units), for three replicates, making up 12 experiment units in total. Seawater and water effluent from shrimp farm were pumped into the systems and retained within the system for 7 days before discharging.

2. Parameter studied were pH, Temperature, Conductivity, Salinity, Turbidity Total Suspended Solid, BOD, Ammonia-Nitrogen (NH<sub>4</sub><sup>+</sup>-N), Total Nitrogen and Total Phosphorus

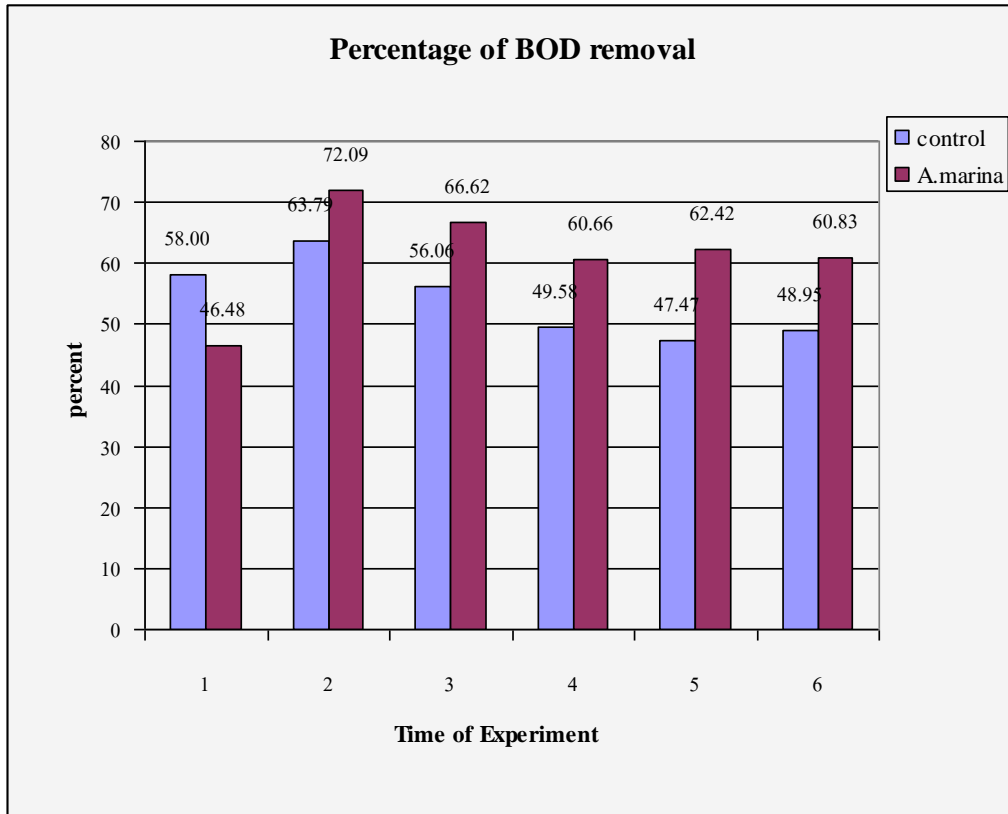
**Results, Discussion and Conclusions :** The research found that *Avicennia marina* could be treated water effluent from shrimp farm better than without plant experiment. The removal percentage of Total Suspended Solid, BOD, Ammonia-Nitrogen (NH<sub>4</sub><sup>+</sup>-N), Total Nitrogen and Total Phosphorus of *Avicennia marina* were 76.94 – 91.43%, 46.48 – 72.09%, 69.86 – 87.56%, 70.32 – 89.80% and 64.04 – 86.76%, respectively. Whereas the removal percentage in control units were 74.86 – 87.68%, 47.27 – 63.79%, 57.14 – 79.66%, 65.10 – 78.65% and 58.64 – 82.32%, respectively. The results suggested that *Avicennia marina* could improve the treatment efficiency in constructed wetland.



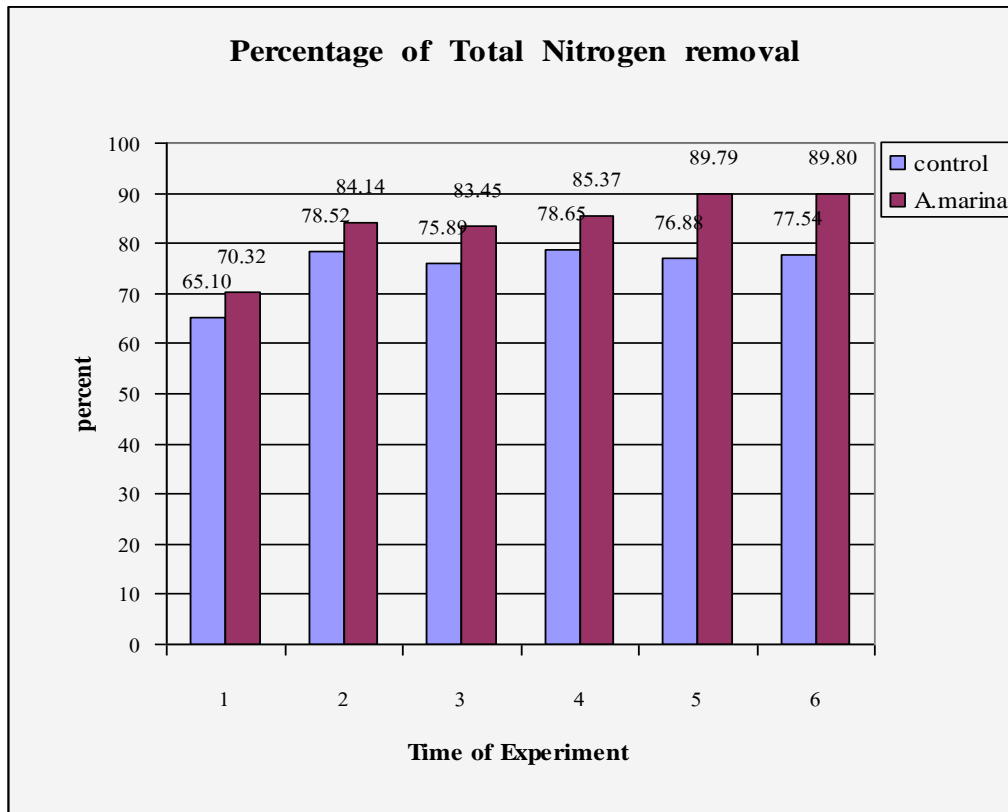
**Figure 1.** Experimental System



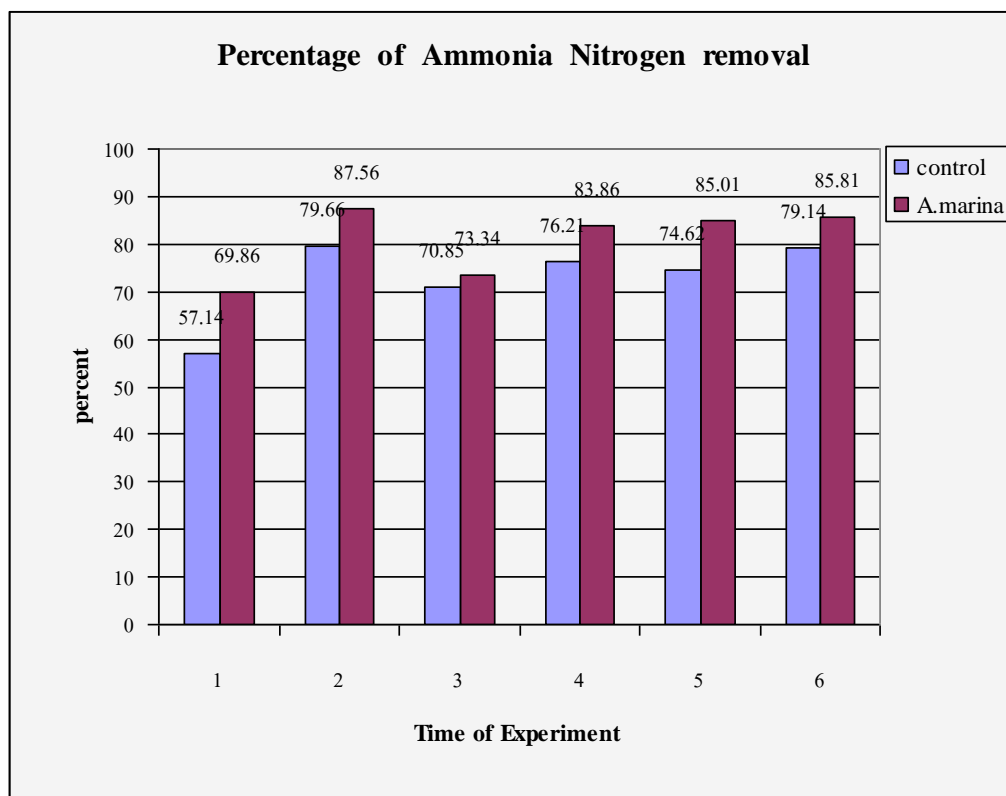
**Fig 2.** The removal percentage of Total Suspended Solid



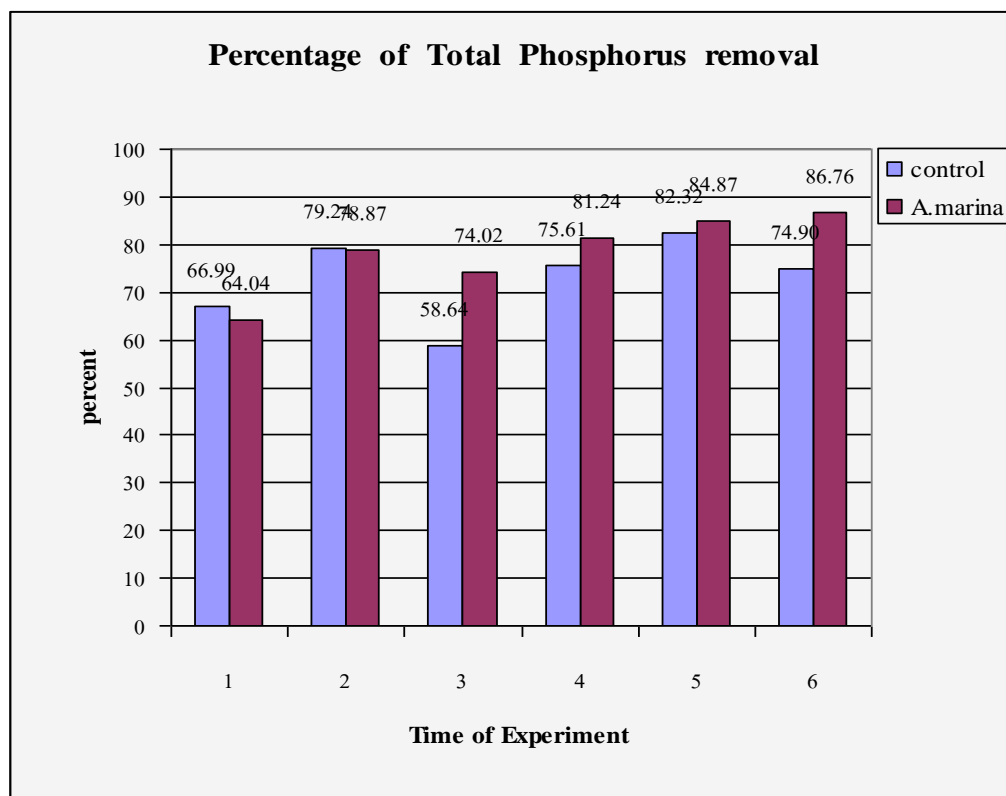
**Fig 3.** The removal percentage of BOD



**Fig 4.** The removal percentage of Total Nitrogen



**Fig 5.** The removal percentage of Ammonia-Nitrogen



**Fig 6.** The removal percentage of Total Phosphorus.

**REFERENCES**

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