

# ADDITION OF MECHANICAL FILTER ON SILVER BARB CULTURE IN RECIRCULATION SYSTEM DUE TO DECREASE AMMONIA CONCENTRATION



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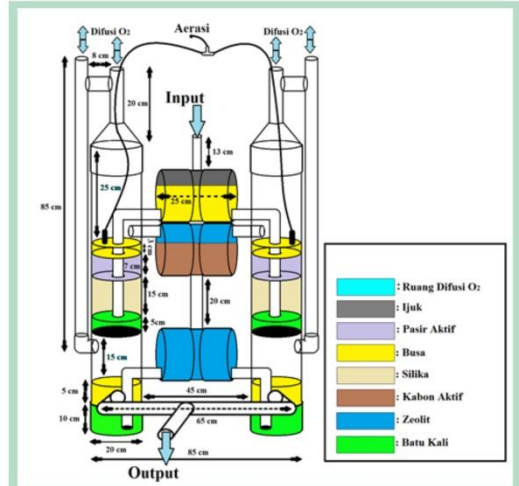
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## ABSTRACT

This study aims to reduce the concentration of ammonia in the silver barb culture in recirculation system by adding a mechanical filter. This research was conducted on January to February 2014 at hatchery of Central of Freshwater Aquaculture Production Development (BPPBAT) Singaparna, Tasikmalaya Regency, West Java, Indonesia. The study was designed experimentally with two treatments, ie treatment without filter and filter treatment was carried out for 24 days and observed every two days. The results showed that the addition of filter can reduce total ammonia up to 92.82%, unionized ammonia up to 89.12%, able to increase Dissolved Oxygen up to 54.23% and silver barb survival rate equal to 99.87%.

Keywords: ammonia, recirculation, silver barb, mechanical filter

## MATERIAL AND METHODS



This research was conducted in January to February 2014 at hatchery of Central of Freshwater Aquaculture Production Development (BPPBAT) Singaparna Tasikmalaya Regency, West Java, Indonesia. The research was conducted experimentally with two treatments, ie treatment without filtering and filtering treatment.

## INTRODUCTION

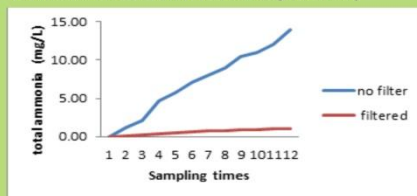
Waste generated from the intensive aquaculture can lead to a decrease in water quality both in the aquaculture environment and in the surrounding waters, this can have an impact on the decrease in aquaculture productivity due to decreasing fish growth and cause death in severe condition (Sugiura et al 2006).

Ammonia is one of the wastes that have to be noticed. Ammonia in the aquaculture is mainly derived from uneaten feed, fish faeces, and fish urine. Ammonia concentration will increase as the protein content in the feed increases. Ammonia is a growth inhibiting factor (Wedemeyer 1996).

The use of filters in aquaculture with recirculation system plays a role to improve water quality in fish ponds. The filter used is a mechanical filter using materials such as zeolites, activated carbon, silica and gravel. This is confirmed by Purtie (2010) which states that zeolites and activated charcoal as adsorbants in filtration can reduce ammonia concentration of 85.40%. The effectiveness of filtration using a mechanical filter is related to the filter design used, as Collins (1998) states that water filters with down-flow and up-flow water flow systems can maximize the filtering process.

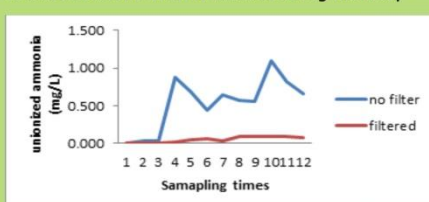
## RESULT AND DISCUSSION

Total ammonia concentrations during the study



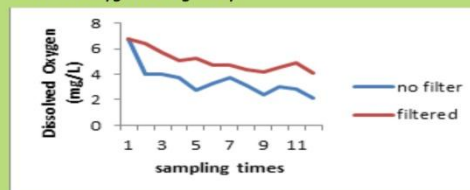
The use of filter on fish ponds using recirculation systems can reduce the total ammonia concentration in water averaging 91.53%.

Unionized concentration of ammonia during the study



shown that the highest unionized ammonia concentration found in the filtered fish pond is in the 9th sampling of 0.0988 mg / l.

Dissolved oxygen during study



The Pb concentration with red color indicates the concentration below the allowed national standard quality according to the Inspectorate of Foods and Drugs (Ditjen POM Republic of Indonesia)

Survival rate of silver barb and unionized ammonia concentration

The survival rate of the silver barb still high up to 6th sampling with the percentage above 90%, but in the 7th survival rate dropped dramatically until there were no fish living on the 11th sampling. The survival rate of silver barb on filtered pond is very high that is 99.8%.

Sampling times	Filtered		No Filtered	
	Ammonia conc. (mg/L)	No. of fish death	Ammonia conc. (mg/L)	No. of fish death
0	0.0394	1	0.0034	8
1	0.0286	7	0.0033	-
2	0.8854	70	0.0164	-
3	0.693	138	0.0477	-
4	0.4381	189	0.0577	-
5	0.6389	321	0.0364	-
6	0.5731	441	0.0909	-
7	0.5579	720	0.0934	-
8	1.0988	1207	0.1388	-
9	0.8151	1683	0.0871	-
10	0.6663	3.602	0.0725	-
11	0.0394	-	0.0034	-

## CONCLUSION

The conclusion of this research is the filter used can reduce total ammonia concentration of 92.82%, unionized ammonia by 89.12 % and increase the concentration of dissolved oxygen by 54.23%, and produce the survival of 99.87%

## REFERENCES

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- Sugiura, S.H., Marchant, D.D., Wiggins, T and Ferraris, R.P. 2006. Effluent Profile of Commercially Used Low Phosphorus Fish Feeds. Environ. Pollut 140, 95-101 pp.