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AQUACULTURE COLLABORATIVE RESEARCH SUPPORT PROGRAM

## RESEARCH REPORTS

Sustainable Aquaculture for a Secure Future

**Title:** Sugarcane Bagasse as Periphyton Substrate in the Culture of Nile Tilapia (*Oreochromis niloticus*) in Fertilized Ponds

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**Abstract:** The study aimed to test the suitability of sugarcane bagasse as substrate in periphyton based aquaculture. The study was conducted at the College of Fisheries-Freshwater Aquaculture Center, Central Luzon State University, Science City of Munoz, Nueva Ecija, Philippines from July to November, 2005.

Two ponds, each measuring 500 m<sup>2</sup>, were stocked with tilapia fingerlings (size #12) at a density of 3 fish m<sup>-2</sup>. The experiment had two treatments: 1- with sugarcane bagasse bundles as substrate, 11- without substrate. Ten poles made-up of galvanized iron were installed in each pond at a regular interval of 200 cm. A bundle of sugarcane bagasse substrate with a length of 60 cm and diameter of 14 cm was placed in each pole. An improvised glass slide holder containing ten glass slides was placed next to the bagasse substrate for the determination of periphyton productivity and chlorophyll a. In Treatment II, since there was no sugarcane bagasse substrate, only the glass slide holder with ten glass slides was placed in each pole.

Among the two treatments, Treatment I gave significantly higher fish final mean weight and total fish weight at harvest. The final mean weight of the fish in Treatment I was 65.95 ± 14.59 g which was significantly different from Treatment II with a final mean weight of 58.52 ± 12.28 g (P<0.05). The mean standard length of Nile tilapia was also significantly higher in Treatment I (11.79 ± 0.85 cm) than in Treatment II (11.36 ± 0.87 cm, P<0.05).

Periphyton productivity and chlorophyll a were determined as indication of periphyton biomass. Periphyton biomass was significantly higher in Treatment I than in Treatment II (P<0.05). This study indicated that higher production can be achieved by fish feeding on periphyton available in the pond and that the periphyton can be increased through the use of substrate like sugarcane bagasse.

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There was a significant difference on the abundance of periphyton between Treatments I and II ( $P < 0.05$ ). On average, there were 23 periphyton genera that were identified. The most number of genera was found in Family Chlorophyceae, followed by Family Bacillariophyceae, Cyanophyceae, Euglenophyceae and Pyrrophyceae.

This abstract was excerpted from the original paper, which was in the Proceedings for the 7th International Symposium on Tilapia in Aquaculture (ISTA7), Wilfrido M. Contreras-Sanchez and Kevin Fitzsimmons eds., Vera Cruz, Mexico, 6-8 September 2006, p.124.

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