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Sustainable Aquaculture for a Secure Future

Title: Comparison of rice straw and bamboo stick substrates in periphyton-based carp polyculture systems

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Abstract: An experiment was conducted to compare rice straw mat and kanchi (bamboo sticks) as substrates in periphyton-based polyculture systems. The experiment had three treatments: (a) no substrate (control), (b) rice straw as a substrate (3 × 2.7 kg pond⁻¹) and (c) kanchi as a substrate (390 kanchi pond⁻¹). Fingerlings (n=40) of rohu, *Labeo rohita* (24.5±0.5 g); mrigal, *Cirrhinus mrigala* (25.1±0.6 g); catla, *Catla catla* (25.8±0.5 g); common carp, *Cyprinus carpio* (27.6±0.6 g), and silver carp, *Hypophthalmichthys molitrix* (30.4±0.9 g) were stocked at a 3:2:2:2:1 ratio and cultured for 90 days. There were no differences in the number of plankton, periphyton and macro-zoobenthos among the treatments. The total plate count of bacteria was higher in the rice straw treatment (41 320 million cfu m⁻²) than that in the kanchi treatment (11 780 million cfu m⁻²). Growth and the final mean weight of rohu, catla and common carp were higher in the substrate treatments than those in the control. Rice straw and kanchi treatment, respectively, resulted in 38% and 47% higher combined total weight gain over control. Gross margin analysis showed that rice straw treatment resulted in more profit than the control and kanchi treatment. Therefore, rice straw has the potential to be used to increase production in the low-input rural aquaculture.

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