RESEARCH PAPER:

Role of an environment friendly organic manure : vermicompost in aquaculture

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SUMMARY

An experiment was conducted to see the effect of a promising compost *i.e.* vermicompost of agriculture and horticulture in fish culture *i.e.* aquaculture. In this experiment, the growth and survival of fry of *Labeo rohita* in comparison to other organic manures was determined which showed maximum survival of fry (78.4%) and highest production (4549.56 kg/ha) in ponds treated with vermicompost. Water quality parameters were also studied to see the impact of different organic manures on pond water.

Key words : Vermicompost, Survival of fry, *Labeo rohita*, Sustainable aquaculture

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Use of vermicompost had given very good results in agriculture and horticulture and thus, this experiment was conducted to see the impact of vermicompost on growth and survival of fry of *Labeo rohita* which is a very delicate stage of the fish where the percentage of mortality of fish seeds is very large.

Here the effect of different organic manures *i.e.* raw cow dung, poultry manure and vermicompost on water quality parameters was also studied to understand the physico- chemical changes occurring in the pond water and how it effects the survival of fry.

MATERIALS AND METHODS

This experiment was conducted in the fish seed farm of College of Agriculture, IGKV, Raipur (C.G.) to rear fry of *Labeo rohita* to fingerlings for 100 days. Three ponds were prepared for this experiment where pond 1was treated with raw cow dung (T1), pond 2 was treated with vermicompost (T2) and pond 3 was treated with poultry manure (T3). Basal dose was applied one week prior to the stocking of fry, and then weekly manuring was done to maintain the natural productivity of ponds. Ponds were stocked with early fry of *Labeo rohita* @ 1 lakh fry/ha and fed with supplementary diet of mustard oil cake and rice bran in 1:1 ratio @ 6% body weight/day in 2 installments. Physico-chemical characteristics of water was checked every week by following standard methods of APHA, 1989. At every 10^{th} day, growth of fry was checked and recorded by determining length and weight of fry of each species. Survival of fry was determined at the end of the experiment when fingerlings were harvested. Growth of fry was determined by the following formulae given below:

$$\text{Average daily weight gain (ADG)} = \frac{\text{Net weight gain (mg)}}{\text{Duration of experiment}} \times 100$$

$$\text{Specific growth rate (SGR)} = \frac{\log_e \text{final weight} - \log_e \text{initial weight}}{\text{Experimental days}} \times 100$$

$$\text{Survival \%} = \frac{\text{Total number of surviving fish}}{\text{Total number of fish stocked}} \times 100$$

RESULTS AND DISCUSSION

The average initial weight of fry at the time of stocking was 0.16 g. Average daily weight gain (ADG) and specific growth rate (SGR) were recorded to be highest in poultry manure treatment followed by vermicompost treatment and lowest was observed in raw cow dung treatment (Table 1). Dhawan and Singh (2000) reported highest ADG (1.05g/day) in poultry manure followed by (0.98g/day) in poultry droppings and lowest (0.43g/day) in cowdung. Singh and Sharma (1999) also reported highest ADG (1.44g/day) in poultry excreta and lowest (0.47g/day) in cowdung treatment. Dhawan and Singh (2000) also reported highest in poultry manure 2.81(% day^{-1}) followed by poultry dropping 2.72(% day^{-1}) and lowest in cowdung 2.14(% day^{-1}) by *Cyprinus carpio* and 2.81(% day^{-1}) in poultry dropping, followed by 2.52 (% day^{-1}) in poultry manure and 2.19(% day^{-1}) in cowdung treatment by *Cirrhinus mrigala*. Singh and Sharma (1999) found highest SGR, 3.06(% day^{-1}) in poultry excreta treatment, followed by 2.85(% day^{-1}) in pig dung treatment