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Effects of *Azadirachta indica* leaf power supplementation on growth and survival of fish *Ctenopharyngodon idella* fingerlings

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Abstract

Neem is used to control the parasites. If Neem give to fish in feed with other ingredients it will increase survival rate and growth of the fishes. The present study was aimed to address the possible evaluation of *Azadirachta indica* leaf powder (5%) as a supplemented diet on fish fingerlings with other ingredients mustard oil cake and Maize as compared to control diet without neem leaf powder feed. In this, collection of ingredients and mixed with proper ration, then formulated feed by the help of Pearson's square method, made Suitable pallet size of feed, then proper drying and given to fish twice a day in proper time. The result of this experiment neem leaf powder feed given more growth (3-18g) and survival rate (84%) in compared to control diet growth (3-14g) and survival (78%). *Azadirachta indica* feed are more effective compare normal other ingredients feed, neem feed are enhance immunity of the fish fingerlings.

Keywords: *Azadirachta indica*, *Ctenopharyngodon idella*, growth, survival

1. Introduction

In recent years, utilization of aquatic plants and weeds having high food value as feed ingredients has taken a new dimension in producing the much required animal protein at low cost. Aquatic weeds also have the added advantage of being cultivated in association with farmed fish species using the same water resources and/or farm effluent (Edwards, Hassan, Chao, & Pacharaprakiti, 1992; Gavina, 1994) [13]. They constitute dietary items for both herbivorous and omnivorous fish species in semi-intensive and extensive aquaculture production (Leonard, 1995). *Azadirachta indica* is one of the most promising plants with compounds known for its insecticidal properties and perhaps the most concerned tree in the world. In Vietnam, the Neem tree is also commonly known as neem and usually grown in popularity in the central coastal region, most particularly in Ninh Phuoc district, Ninh Thuan province. Significant hypoglycemic, hypolipidemic, hepatoprotective, anti-fertility and hypotensive activities were found in water soluble extract of *A. indica* leaves. In freshwater fish farming, losses in productivity due to fish parasites and fish predators are great and often controlled by applying toxic chemicals indiscriminately. This not only leads to high levels of toxic compounds in fish but also may affect their performance. In order to reduce the damage of the use of synthetic chemicals, there have been plenty of researches on pest control by substances from plants as an alternative method. According to Dunkel and Ricilards (1998) [3], Martinez (2002) [2], neem and products from neem have been stated to be effective in controlling fish predators and parasites in aquaculture systems. Currently in Vietnam, there have been many researches and application of extract from neem in varying purposes. However, the impact of neem leaf extract on the aquatic environment and ecology, environmental friendliness has not been investigated. In this study, we assessed the impact of extracted compound from neem leaves to the water quality and protozoa community of fresh water catfish ponds in Binh Duong province in order to provide more scientific for application of neem tree in fish farming. Neem leaves are used to treat leprosy, eye disorders, intestinal worms, upset stomach, skin ulcers and blood vessels, fever, diabetes and liver problems. Neem oil is also an effective contraceptive.

All the parts of the neem tree are beneficial in different ways. Various soaps, lotions and shampoos made out of neem oil. Neem leaves are really effective in keeping mosquitoes at bay.

2. Material and Methods

Scientific classification

Kingdom	Animalia
Phylum	Chordata
Class	Actinopterygii
Order	Cypriniformes
Family	Cyprinidae
Subfamily	Squaliobarbinae
Genus	Ctenopharyngodon
Species	<i>C. idella</i>

2.1 Characteristic features of *Ctenopharyngodon idella*:

Grass carp is characterized with a wide and scale, less head, sub terminal or terminal mouth with simple lips which do not include barbels, protracted upper jaw and a very short snout. The body is slender and rather compressed with a rounded belly and slightly decurved lateral line.

2.2 Procurement of Fingerlings

For the purpose of present study, healthy, disease free fingerlings of *Ctenopharyngodon idella* were collected from Banglabandh our Aquaculture Department, Barkatullah University, Bhopal Madhya Pradesh.

2.3 Feed Formulation

Collecting the fresh leaf of *Azadirachta indica*. Then Sun dry in fresh and clean area.

and collected other feed ingredients use as feed formulation like maize bran, fish meal, mustard oil Cake, etc. After collection grind all feed ingredients and use Pearson square method to the feed formulation calculating the value of ingredients according to our requirements. weigh all ingredients by the help of weigh machine. Mixed the all ingredients according to our requirements, mixed binder to

proper binding feed pallet. The feed ball in autoclave and make feed pellets and Dry. Start feeding twice in a day according to the time.

2.4 Formulation of basal diet

Basal diet with 30% protein content was formulated following the Pearson square method. Proportionately selected ingredients were quantified and presented in this table.

Table 1: Composition of Basal diet.

Ingredients	Diet
Fish meal	22.44%
Mustard oil cake	22.44%
Maize	55.12%
Total	100

Artificial diet was prepared to feed the fishes with various feed ingredients. Fish meal, wheat flour were finally ground and proximate analysis was performed using Pearson square method. Based on this analysis, one practical diet was formulated containing 30% protein. Vitamin and mineral mixes were then added by continuous mixing. Distilled water (27 °C) was slowly added to the feed to get desired consistency for pelleting. This was then extruded in hand pelletizer using a 1mm die and dried for 4 - 6 hours below 45 °C and subsequently air-dried overnight to reduce moisture content less than 10%. Dried feed was chopped into pellets in a blender passed through sieves to ensure a homogenous particle size (0.5 - 1.0 mm). The feed was further stored at room temperature in air tight jars.

Preparation of experimental diet:

2.5 Experimental diet

With *Azadirachta indica* were prepared by replacing ingredients mixture in the basal diet by *Azadirachta indica* powder at the rate of 5% maize bran and vitamin-mineral mixture contents were the same as in all the four formulated feeds. The feed was pelletized with hand pelletizer, dried and stocked in air tight jars.

Table 2: Percentage composition of various ingredients in experimental Diets.

Preparation of Experimental Diets					
Diets	Fish meal	Mustered oil cake	Maize bran	Vit+min	<i>Azadirachta indica</i>
Control	22.44%	22.44%	55.12%	5%	0%
Experimental Feed(5% NEEM)	22.44%	22.44%	55.12%	5%	5%

3. Results

3.1 Length, Weight and Survival rate analysis

At the termination of the experiment, highest value for average weight gain in the fishes was observed in feed with 5% *Azadirachta indica* which came out to be 18 gm and lowest value for average weight gain in the fish was observed in feed without *Azadirachta indica* as 14 gm. Hence, feed with 5% *Azadirachta indica* was found best as it had the highest value for average weight gain in the fishes.

At the termination of the experiment, highest value for

average length in the fishes was observed in feed with 5% *Azadirachta indica* which came out to be 12 cm and lowest value for average length in the fish was observed in feed without *Azadirachta indica* as 10 cm. Hence, feed with 5% *Azadirachta indica* was found best as it had the highest value for average length in the fishes.

At the termination of the experiment, 84% survival rate was observed in the feed with *Azadirachta indica* all the percentage levels respectively. Whereas 78% survival rate was observed in fishes fed without *Azadirachta indica*.

Table 3: showing observed average weight (gm) of *Ctenopharyngodon idella* using different feed

Ponds	Feeds	Observed average weight in gm						
		Initial average weight	15 th Day	30 th Day	45 th Day	60 th Day	75 th Day	90 th Day
1 st	Control Feed	3	4	6	8	10.5	12	14
2 nd	5% <i>Azadirachta indica</i>	3	4.6	7.8	11	14.6	16	18

Table 4: showing observed average length (cm) of *Ctenopharygodon idella* using different feed

Ponds	Feeds	Observed average length in cm						
		Initial average Length	5 th Day	30 th Day	45 th Day	60 th Day	75 th Day	90 th Day
1 st	Control Feed	4	5	5.8	6.5	7.8	9	10
2 nd	5% <i>Azadirachta indica</i>	4	5.2	6.5	8.2	9.7	11	12

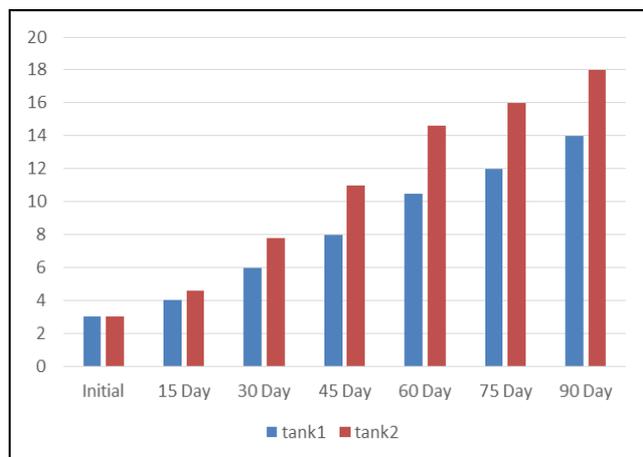


Fig 1: Showing variations in weight of control (Tank1) and experimental (Tank2).

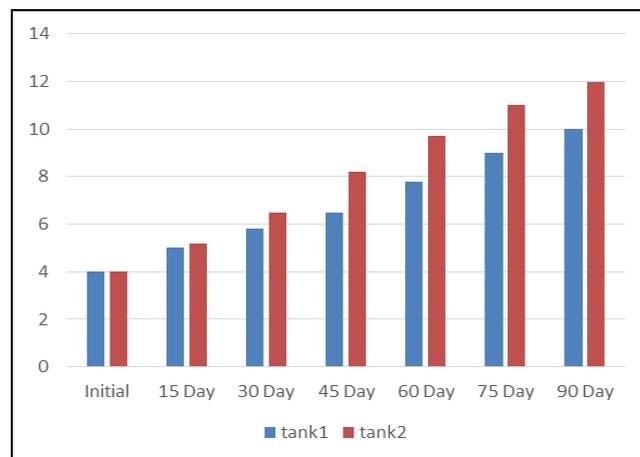


Fig 2: Showing variations in length of control (Tank1) and experimental (Tank2).

Table 5: Showing Survival Rate of *Ctenopharygodon idella* at during experimental period

Ponds	Feeds	Survival rate(%)
1 st	Control Feed	78
2 nd	5% <i>Azadirachta indica</i>	84

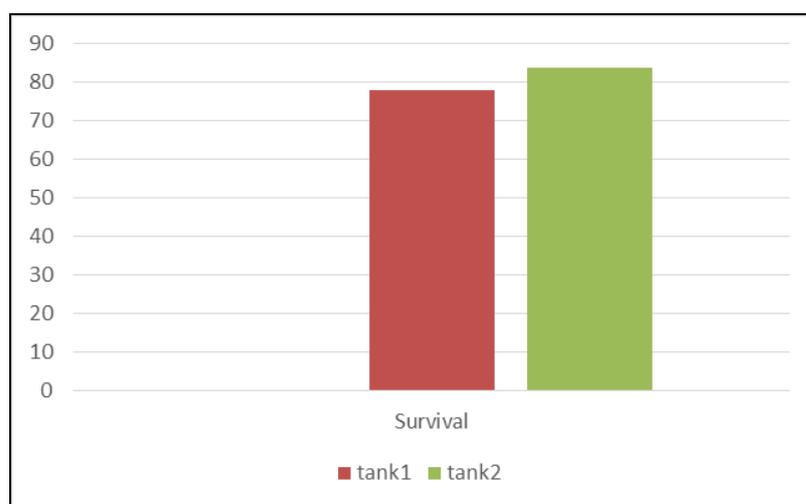


Fig 3: Showing survival rate in control Tank 1 and experimental Tank 2

4. Conclusion

Azadirachta indica feed are more effective compare normal other ingredients feed,neem feed are enhance immunity of the fish fingerlings.They are very helpful of the farmer decrease the feed and medicine cost of the farmer.Its play important role to create disease free fish culture.

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