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THERAPEUTIC STRATEGY FOR CONTROLLING DISEASE IN PANGUS (*Pangasius pangasius*) BY HERBAL EXTRACT

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ABSTRACT

Nargis A, Khatun M, Talukder D (2013) Therapeutic strategy for controlling disease in pangus (*Pangasius pangasius*) by herbal extract. *J. Innov. Dev. Strategy*. 7(1), 17-19.

The use of medicinal plant products as potential therapeutic measures for controlling fish diseases were investigated. For this purpose, fingerlings of *Pangasius pangasius* were fed with diets containing aqueous extracts of Akanda leaves (*Calatropis gigantean*) and Garlic (*Allium sativum*) pest. The immunostimulant effects of food additives caused a good result compared to the control group. After 90 days experiment SGR% (specific growth rate) in aquarium A, B and C (control) were 28.22, 36.22 and 22.33 with food conversion ratio (FCR) 35.43, 27.60 and 44.77, respectively. The mortality rate (%) in A, B and C were 36, 32 and 44, respectively.

Key words: *medicinal plants, akanda leaves, garlic, pangus fry*

INTRODUCTION

In aquaculture, massive increase is put on studies of the fish immune system and defense against diseases. Fish are the first animal phyla to possess both an innate and adaptive immune system making them very interesting as regards developmental studies of the immune system (Magnadotfir 2010). El-Gegary *et al*. (1991) described, a common fish disease is epizootic ulcerative symptom characterized by the presence of severe, open dermal ulcers on the head, on the middle of the body and on the dorsal region of the fish. Hossain (2008) stated that the disease generally develops with ulcers on the fish bodies and the fish may die within a week of being infected.

Medecinal plants possess many chemical substances in the cells and tissues which are the real substances that are responsible for various therapeutic properties and pharmacological actions. Thus, they play a significant role in providing primary health care for fishes. Magnadotfir (2010) worked on the role of immunostimulants in fishes. So, an attempted was made to utilize this medicinal plant for health vigor of fishes. For this purpose, fingerlings of pangus which were affected by epizootic ulcer were fed with diets containing aqueous extracts of Akanda (*Calatropis gigantean*) and Garlic (*Allium sativa*).

MATERIAL AND METHODS

The experiment was conducted in Research Laboratory of Bangladesh Council of Scientific and Industrial Research (BCSIR) Laboratories Rajshahi, Bangladesh from February to July 2011. Three glass aquariums (A, B and C) measuring 32 × 32 × 32 cm^3 were used for rearing the fish fry. The bottoms of these tanks were covered with soil (1.5 inch). The surfaces of these tanks were covered by iron-wire net of small mesh size (0.5 inch) to save the fish from jumping. The infected fish fry were collected from Balanagar, Rajshahi. The fry were infected mainly at the mouth and tail region.

The aquariums were designated as A, B and C according to the amount and items of food supplied. A batch of 25 (108.21±3.57) fingerlings was released in each of the tanks. Two third of aquarium were filled with tap water. The temperature, pH and dissolved oxygen were recorded with the help of a water quality checker (Model: WQC-24-Japan). The variation of temperature, pH and dissolved oxygen were recorded as 17°C-31.5°C, 6.2-7.4 and 5.1 ppm, respectively. Each supplementary feed was supplied to the hatchlings of pangus in the form of pellet twice (At 8.00 am and 6.00 pm) in a day. The growth of the hatchlings were noted in length (mm) and weight (g) were from starting the experiment up to 90 days. In aquarium A and B, `a' type food was supplied, i.e. food with Akanda extracts and garlic pest and `C' is control.

Freshly collected Akanda leaves (*Calatropis gigantea*) were washed and thoroughly grounded with water in a blender, produce 1 liter juice. The maize bran (400 g), mustard oil cake (200 g), wheat bran (200 g), ground nut oil cake (95 g), soybean cake (100 g), crushed oyster shell (5 g), garlic pest (*Allium sativa*) 200 g were thoroughly mixed with the juice. The fish feed prepared in pellet form. This pellet fish feed were sun dried and produced 1200 g herbal fish feed. Protein level (N×6.25) was determined by the Kjeldahl method after an acid digestion using an Auto Kjeldahl system (1030*Autoanalyser, tecator, Hoganos, Sweden). Fat level was determined by the ether extraction method by Soxtec system ht (Soxtee system HT6, Tecator, Hoganos, Sweden). Moisture and ash were analyzed after AOAC (1990).

RESULTS AND DISCUSSION

Table 1 shows the mortality and survival rate of the hatchings of pangus with different supplementary feed. The mortality rate is higher in control group C (11) than those of aquarium A (9) and B (8). The percentage of the survival of the fry in aquarium A and B Were 64 and 68, respectively. The plant materials tested for immunostimulatory food additives caused an effected action compared to the control group. The growth rate of

the hatchings of Pangus of these feeding experiment presented in Table 2. The final length of the fry in aquarium A and B are high 164.6 mm and 168.5 mm and weight gain % are 52.80 g and 67.77 g then the control group (C) over the initial length and initial weight.

The daily growth co-efficient are 81.13 and 89.13, specific growth rate (SGR %) are 28.22 and 36.22 and food conversion ratio (FCR) are 35.43 and 27.60 in aquarium A and B, respectively.

Table 3 shows proximate composition of the fry. The percentage of moisture, protein, fat and ash in fry before setting the experiment are 78%, 63.34%, 116%, and 1.75%. After 90 days experiment the percentage of moisture, protein, fat and ash are 80.6%, 75.9%, 138% and 1.96%. Magnadotfir (2010), San (2012) and Hossain *et al.* (2011) worked on immune defense in fish which is a crucial factor in disease resistance. Paula *et al*. (2013) worked on fish and shell fish immunology for controlling disease. Nargis and Khatun (2011) worked on *Labeo rohita* fries for controlling ulcer which were fed with diets containing aqueous extracts of Nishinda (*Vitex negundo*) and Garlic (*Allium sativum*) pest.

The immunostimulant effects of the dietary intake of various medicinal plant extracts on fish, rainbow trout (*Oncorhynchus mykiss*) were investigated by Dugenci *et al.* (2003). For this purpose fish were fed with diets containing aqueous extracts of mistletoe (*Viscum album*), nettle (*Urtica dioica*) and ginger (*Zingiber officinale*). They found that phagocytosis and extracellular burst activity of blood leucocytes were significantly higher in the group than those in the control group. All plant extracts added to fish diet increased the total protein level in plasma except 0.1% ginger. The highest level of plasma proteins was observed in the group fed with 1% ginger extract containing feed. Saleh *et al.* (2002), Hankrishan *et al.* (2003) also worked on some medicinal plants as immunostimulant for fish. Saleh *et al.* (2002) worked on the effect of black cumin seeds, *Nigella sative* in the immunostimulent for fish. Kush and Gibson (2003), Siwicki and Anderson (1994), Sohn *et al*. (2000) and Suomclainen (2009) were also worked on immunostimulated groups of fish were more resistant to the disease, confirming the potential use of these substances in fish culture for the prevention of diseases.

Table 1. Mortality and survival of the hatchlings of pangus with different supplementary feed

Aquariums	Foods	Duration of Experiment (90 days)									Total Mortality	Total Survival	% of Mortality	% of Survival
		10	20	30	40	50	60	70	80	90				
A	a	2	1	1	2	1	1	–	1	–	9	16	36	64
B	a	1	1	2	–	2	–	1	–	1	8	17	32	68
C	b	–	–	2	3	–	2	–	2	2	11	14	44	56

Table 2. Growth, food conversion ratio and weight gain of pangus under different text diet

Parameters	A	B	C
Initial length (mm)	113.7	113.7	113.7
Final length (mm)	164.6	168.5	154.1
Initial weight (g)	48.1	48.1	48.1
Final weight (g)	73.5	80.7	68.2
Weight gain (g)	25.4	32.6	20.1
Weight gain %	52.80	67.77	41.78
Daily growth co-efficient (DGC)	81.13	89.13	75.24
Specific growth rate (SGR% per day)	28.22	36.22	22.33
Food conversion ratio (FCR)	35.43	27.60	44.77

Table 3. Proximate composition of different feed ingredients

Feed ingredients	Protein (%)	Dry mater (%)	Total ash (%)	Crude fiber
Maize bran	7.05	80.16	5.21	12.6
Mustard cake	27.46	86.72	7.13	10.09
Wheat bran	10.09	81.15	5.18	9.51
Ground nut shell	8.2	–	14.6	11.90
Soybean cake	41.36	87.15	6.18	–
Oyster shell	1.86	97.17	86.03	–

Table 4. Proximate composition of the fry

Moisture %	Protein %	Fat %	Ash %
Before experiment- 78	63.34	116	1.75
After experiment- 80.6	75.9	138	1.96

CONCLUTION

The use of immunostimulants for the disease protection in fish caused a good result. The control of epizootic ulcer in Pungas fry is highly effective by use of medicinal plant. This experiment will encourage the fishermen to use the medicinal plants for controlling the fish disease.

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