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USE OF MEDICINAL PLANTS HOLARRHENA PUBESCENS AND SARACA ASOKA IN FORMULATED FISH FEED AND ITS EFFECT ON GROWTH PARAMETERS IN CYPRINUS CARPIO FINGERLINGS

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ABSTRACT:
In present experiment variable ratio was designed for diet EHS-1 (Holarrhenapubescens 90g and Saracaasoca 10 g/kg), EHS-2 (Holarrhenapubescens 80g and Saracaasoca 20 g/kg), EHS-3 (Holarrhenapubescens 70g and Saracaasoca 30 g/kg), EHS-4 (Holarrhenapubescens 60g and Saracaasoca 40 g/kg).control diet is without Holarrhenapubescens and Saracaasoca.
The specific growth rate (percent) of Cyprinus carpio fingerlings, significantly higher ($P \leq 0.05$) than that of the control group fishes (0.81 ± 0.03). But in between the treatment groups there was no significant difference ($P \geq 0.05$) in SGR. FCR in between the treatment groups. But all the medicinal plant richs treated groups showed significantly lower ($P \leq 0.05$) FCR compared to the control group. The mixed medicinal plant rich treated group showed the lower FCR and the control group showed the higher FCR. Survival percentage of Cyprinus carpio fingerlings of different trial group was 100percent survival in Group - 2 and Group-3 at the end of the trial period where as 97.64percent survival was recorded in Group-1 and followed by control group. No significant difference ($P \geq 0.05$) in the survival percentage among the dissimilar trial groups
Key words: Ointment**,**Holarrhenapubescens ,Saracaasoca , fish feed,FCR, Fish Growth

I. INTRODUCTION:

Since ancient time weal plants for disease cure . ancient documentary proof of medicinal plant practice was found on a Sumerian time, around 5 thousand years ago (1) Plants having medicinal ability was been used as conventional medicine since the decades. The medicinal plant extract obtained from various parts viz. leaves, roots and stem have been utilized as ailments for many diseases [2] hence these all medicinal Plants used as necessary foundations in therapeutic mediators to cure various diseases occurred in human and animal. Conventionally the herbal medications served as holistic loom for protection and to improve metabolism and health [3]
The increasing price of protein containig fish food and chemical fertilizers as well as the general concern for energy conservation have created awareness in the utilization of rice and other crop fields and livestock wastes for fish culture in mixture with agriculture or livestock is a unique and lucrative venture and provides a higher farm income, makes available a cheap source of protein for the rural population, increases productivity on small land-holdings and increases the supply of feeds for the farm livestock (4,5,6)
In present investigation we were used Holarrhenapubescens: Commonly known as Indra-jao in regional language . A kind of shrub, grow up to 3 meter in height. Small stem with pale bark.. White color flowers, at the end of branches. This medicinal plant was been described within Ayurveda , use for Diarrhoea and stomach disturbances further the bark is helpful for piles, various skin diseases.
Another plant we were used Saracaasoca (Ashoka Tree)Native Indian medicinal plant, also available in Burma and Malaya, upright tree, evergreen, soft, bark having grey-brown shade. The coronet is solid, sharp. Flowers seen almost the year,as per Ayurveda SaracaAsocaused for gynecological problems it is best in various infections and hemorrhagic loose motions , best in bacterial infections, worm infestations, so we have been used its dry powder as one of the disinfection source in present ointment formulation.

MATERIALS AND METHODS:

1 TRIAL DIET

1.Preparation of Holarrhenapubescens and Saracaasoca rich diet: and antibacterial extract preparation The fish feed was prepared out were shown in table 1 here we were used locally available fish feed ingredients along with autoclaved soybean to reduce amount of anti- nutritional factors , rice bran, wheat used with groundnut oil cake.Holarrhenapubescens and Saracaasoca were sun dried first and used in powdery form in fish diet. Here we made small pellets so as to become easy to consume fish fingerlings. For preparing trial diet. The feed was then dried at 40°C and packed in air tight polythene packs and stored at -4°C. variable ratio was designed for diet EHS-1 (Holarrhenapubescens 90g and Saracaasoca 10 g/kg), EHS-2 (Holarrhenapubescens 80g and Saracaasoca 20 g/kg), EHS-3 (Holarrhenapubescens 70g and Saracaasoca 30 g/kg), EHS-4 (Holarrhenapubescens 60g and Saracaasoca 40 g/kg).control diet is without Holarrhenapubescens and Saracaasoca.

Table 1. Investigational diet with HolarrhenapubescensandSaracaasoca

Ingredients (INpercent)	**Trial Feeds**				
Ingredients	**control**	**EHS-1**	**EHS-2**	**EHS-3**	**EHS-4**
Soybean flour	55	55	55	55	55
Wheat	10	10	10	10	10
Rice bran	05	05	05	05	05
Ground nut oil cake	25	25	25	25	25
Holarrhenapubescens	00	90	80	70	60
Saracaasoca	00	10	20	30	40
* gram per 1 kg of basal diet					

2 FEEDING TRIAL

The fishes were fed with pelleted feeds at the rate of 5percent of the body weight every day. The daily ration was divided into two equal parts and fed at morning 10 AM and evening 6 PM.

3 BIOCHEMICAL ANALYSIS OF DIET

Analysis of feed was done to estimate the proximate composition following standard methods of AOAC (1995).

A. MOISTURE

Pre weighed sample was taken and dried in a hot air oven at 105^{o}C to constant weight and the moisture content was calculated using the following formula:

$$\textbf{Moisture (percent)} = \frac{\text{Wet weight of sample} - \text{Dry weight of sample}}{\text{Wet weight of sample}} \times 100$$

B. CRUDE PROTEIN (CP)

Nitrogen content of the sample was estimated quantitatively by **automatedKjeldahl** analyserand crude protein was estimated by multiplying nitrogen percentage by a constant factor (6.25).

CP (percent) = Nitrogen (percent) x 6.25

C. ETHER EXTRACT (EE)

Ether Extract was estimated by Soxlet (soxtech) system analyzer using diethyl ether (boiling point, 40-60^{o}C) as a solvent.

$$\text{Ether Extract (percent)} = \frac{\text{Weight of ether extract}}{\text{Weight of the sample}} \times 100$$

D. ASH CONTENT

The sample was taken in a silica crucible and placed in a muffle furnace at 600^{o}C for six hours . Crucible was then transferred to a desiccators and ash was weighed when it reached room temperature. Ash content was calculated as follows:

$$\text{Ash percent} = \frac{\text{Weight of ash}}{} \times 100$$

Weight of sample

E. TOTAL CARBOHYDRATES

Whole carbohydrate was calculated by subtracting the quantity of additional components from 100.Total carbohydratepercent = 100 - (CPpercent + EEpercent + Ash percent)

F. DIGESTIBLE ENERGY VALUE :

The digestible energy value of feed was calculated on the basis of standard physiological values (Halver, 1976) as per following formula.

Digestible energy (Kcal/ 100g) = Protein (percent) x 4+ Lipid (percent) x 9 +Carbohydrate (percent)x 4

G. GROWTH INDICES:

Fishes from all the treatment groups were sampled initially, finally and in the middle of the trial period to record the weight. Growth parameters such as specific growth rate, food conversion ratio, Percentage weight gain etc. were estimated at the end of the experiment. The animals were kept starved overnight before body weight measurement.

G1. PERCENTAGE WEIGHT GAIN

$$\text{Percentage weight gain} = \frac{\text{Final weight – initial weight}}{\text{Initial weight}} \times 100$$

G2. SPECIFIC GROWTH RATE (SGR)

$$\text{Specific growth rate} = \frac{\text{Ln (Final weight) – Ln (Initial weight)}}{\text{Trial periods in days}} \times 100$$

G3. FOOD CONVERSION RATIO (FCR)

$$\text{Food conversion ratio} = \frac{\text{Feed given (dry weight)}}{\text{Body weight gain (wet weight)}}$$

G4. FEED EFFICIENCY RATIO (FER)

$$\text{Feed efficiency ratio} = \frac{\text{Net weight gain (wet weight)}}{\text{Feed given (dry weight)}}$$

G5. PROTEIN EFFICIENCY RATIO (PER)

$$\text{Protein efficiency ratio} = \frac{\text{Net weight gain (wet weight)}}{\text{Crude protein fed}}$$

RESULTS

4.1 PROXIMATE COMPOSITION OF TRIAL DIET

The proximate contents of the trial diet arerepresented in Table 2. The dry matter composed of 93.13 percent of the feed. The crude protein content was 30.60 percent. The ether extract was 9.81percent and total carbohydrate was 46.24 percent. The total ash content of the diet was 7.99percent and the calculated digestible energy was 421.08 Kcal/ 100g.

Table 2. Proximate composition of trial diet

	Components	**Composition (percent)**
	Dry matter	88.65

Crude protein	30.60
Ether extract	10.26
Total carbohydrate	46.24
Total ash	7.99
Digestible energy (Kcal/ 100g)	421.08

GROWTH PARAMETERS:

4.3.1. MEAN BODY LENGTH

The body length of the fishes was recorded at the beginning, middle andend of the experiment. The mean body length of Cyprinus carpiofingerlings of differentTrial groups are presented in Fig.4. The initial body length (cm) was 6.20 ±0.04. Significantly higher values were observed in B2 (8.11 ± 0.01) and Group-3 (8.19 ±0.04) group and lower values were observed in Group-1 (7.92 ± 0.07) and control (7.88 ±0.06).

4.3.2. MEAN BODY WEIGHT

The body weight of the fishes was recorded of the experiment. The mean body weight (g) of Cyprinus carpiofingerlings of different trial groups are presented in Fig.5. The initial body weight of the fishes was 3.7 ± 0.68. As compared to other treatment groups, significantly higher (P≤0.05) final weight was observed in GROUP-3 group (7.39 ± 0.09), and lower was found in the control group (6.38 ± 0.14).

4.3.3. PERCENTAGE WEIGHT GAIN

The percentage weight gain of Cyprinus carpiofingerlings is presented in Table 1. The weight gain percentage of all the treatment groups was significantly higher (P≤0.05) than the control group with higher value in GROUP-3 group followed by group 2 and GROUP-1 respectively.

4.3.4. SPECIFIC GROWTH RATE (SGR):

The specific growth rate (percent) of Cyprinus carpiofingerlings is presented in Table 1 and Fig.7. Specific growth rate of all the medicinal plant richs treated group fishes was found to be significantly higher (P≤0.05) than that of the control group fishes. But in between the treatment groups there was no significant difference (P≥0.05) in SGR.

4.3.5. FOOD CONVERSION RATIO (FCR):

Data pertaining to food conversion ratio is given in Table 1 and Fig.8. There was no significant difference (P≥0.05) in FCR in between the treatment groups. But all the medicinal plant richs treated groups showed significantly lower (P≤0.05) FCR compared to the control group. The mixed medicinal plant rich treated group showed the lower FCR and the control group showed the higher FCR .

4.3.6. FEED EFFICIENCY RATIO (FER)

Feed efficiency ratio (FER) of different trial group fishes is presented in Table 1 and Fig.9. FER for of all the treatment groups was significantly higher (P≤0.05) than that of control group fishes, and there was no significant difference (P≥0.05) between the treatments.

4.3.7. PROTEIN EFFICIENCY RATIO (PER)

Data concerning to protein efficiency ratio (PER) shown in Table 1 and. The PER of all the medicinal plant rich feed treated groups was observed to be significantly higher (P≤0.05) than that of the control group .There was no significant difference between the treatments (P≥0.05), other than Group-3 PER showed optimum level .

4.3.8. SURVIVAL PERCENTAGE

Survival percentage of Cyprinus carpiofingerlings of different trial group was 100percent survival in Group - 2 and Group-3 at the end of the trial period where as 97.64percent survival was recorded in Group-1 and followed by control group. No significant difference (P≥0.05) in the survival percentage among the dissimilar trial groups.

DISCUSSION:

In the present study, the weight gain percentage of all the treatment groups was significantly higher than the control group with highest value in group-3 (90.65^{c}±3.32) which was fed with a diet EHS-3 (Holarrhenapubescens 70g andSaracaasoca 30 g/kg).

Treated groups were significantly higher than the control. Although there was no significant difference in the growth parameters between the treatment groups, the group-3 showed the higher SGR, FER, and PER. Hernandez (4) observed higher values for body weight, weight gain and specific growth rate in the juveniles of Poeciliopsisgracilis when fed with Artemia nauplii enriched by L.casei. yet there is no study occurred by using present plant based diet for fish. Medicinalplants(includingalgaeandmushrooms)presentpromisingpotentialforuseinaquacultureasa substitutefor chemotherapyinthetreatmentofdiseaseoutbreaks.

Table 1:- Growth parameters (Mean ± SE) of Cyprinus carpiofingerlings of Variable trial groups.

Trial Groups/and fish feed	**Weight Gain percent**	**Specific Growth Rate (SGR)**	**Food Conversion Ratio (FCR)**	**Feed Efficiency Ratio (FER)**	**Protein Efficiency Ratio (PER)**
Group-1 **EHS-1**	80.1^{b}±2.77	0.83^{b}±1.01	4.07^{a}±0.13	0.22^{b}±0.01	1.23^{b}±0.12
Group -2 **EHS-2**	89.98^{b} ±0.4	1.11^{b}±0.01	3.51^{a}±0.04	0.29^{b}±0.06	1.36^{c}±0.04
Group -3 **EHS-3**	90.65^{c}±3.32	1.34^{b}±0.01	3.15^{a}±0.09	0.23^{c}±0.07	1.39^{c}±0.06
Group -4 **EHS-4**	89.35^{c}±3.32	1.14^{b}±0.04	3.07^{a}±0.02	0.20^{c}±0.03	1.31^{c}±0.01
Control	62.72^{a}±2.17	0.73^{a}±0.07	3.07^{b}±0.11	0.19^{a}±0.03	0.91^{a}±0.08

The mean values bearing different superscript differ significantly ($P \leq 0.05$).

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