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# THE *CARDIOSPERMUM HALICACABUM* FEED UTILIZATION OF THE FRESHWATER FISH *LABEO ROHITA*

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**Abstract**
*The present study focused the Cardiospermum Halicacabum plant have various medicine uses. This medicine plants helps to enhance immune power consume animals like aquatic animals and terrestrial animals especially our research focus Labeo rohita feed supplementary diet mixed with commercial feed Medicinal plants have been used in various traditional systems as they have immune potential against numerous diseases. In the present investigation, utilization of different feed on normal fish Labeo rohita have been studied for many hours. The feed utilization monitor various parameters growth, weight, reproduction well utilized various organs.*
**Keywords**: *Environment, Cardiospermum Halicacabum, Labeo rohita, Parameters.*

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## INTRODUCTION:

Environment is the sum total of water, air and land interrelationships among themselves and also with the human being, other living organisms and other property. It includes all the physical and biological surroundings and their interactions[1].Water is an essential requirement of human and activities developed and it is one of the most delicate part of the environment. The physico-chemical properties of water and diatom have been studied in different aquatic habitats the present study reports on the physicochemical properties of water[2]. Water pollution is usually caused by various human sources, typically (point and non-point) industrial facilities and agrochemicals especially in aquatic ecosystem, has grown up to be a serious environmental problem nowadays[3]. Now day's farmers are using an assortment of pesticide and insecticide monocrotophos in their grassland of cultivation devious the insect pest. Residual of this pesticide alters into the ecosystem and trouble the healthy environment and aquatic forms. Aquatic farm contains fish and other organism. But the fish is mostly affected by pesticide residuals[4]. The random use of different pesticides often causes lot of damage on non-target organism. Organophosphate pesticides constitute a large proportion of the total synthetic chemicals employed for the control of pests in the field of agriculture, veterinary practices and public health[5]. The acute toxicity test indicates the relative species sensitivity and lethal concentration which can be used as a basis for long-term tests to establish the requirements necessary for the well being of aquatic life[5]. The industrial development and rapid urbanization has led to development of polluted zones discharging potentially toxic compounds in the environment. Especially, indiscriminate use of pesticides resulted in contamination of aquatic system has now become a global problem and is being extensively researched worldwide [6].Adversely human activities are directly or indirectly affect the environment [7].The organophos-phorous compounds are widely used because of their rapid biodegradability and non-persistent nature. Recent studies have proved that extremely low quantities of pesticides which enter the aquatic environment can affect productivity of organisms to kill eggs and larvae[8].Supplementary feeds are required for intensive culture system. Supplementary feeds are combination of different ingredients, both from plants and animal origins and they can be administered different forms [9]. For production of fish in aquaculture good quantity of feed is a primary requisite. The majority of fish species require 40-50 percent protein in diet [10]. The similar [11] has found 25-30 percent requirement for carps and tilapia. Various types of materials are used as fish feed ingredients in previous years [12-14]. Several authors have reported the utilization of plant materials as feed. Cassava leaf meal has been incorporated as a dietary protein source in pelleted feed for *Nile Tilapia* [15]. The feeding of supplementary feed in pisciculture has been undertaken by a number of workers [16].

Elankumaran *et al*. [17] have reported the highest consumption, absorption, conversion and protein conversion efficiency (PCR), in the fish fed with earthworm. Supplementary feeding is an important tool for augmenting fish production. In fish nutrition, protein is an important ingredient because of its influence on growth and its direct relationship to diet cost [18]. Role of nutrition in heavy metal toxicity has been considerably studied and essential organic substances such as calcium, iron, zinc, manganese and sulphur containing amino acids are now known to alter metal toxicity [19]. The growth indicators are designated responses in toxicity tests of fish. Das [20] has reported that the feed utilization efficiencies of Tilapia with diets containing leaf powder of different levels are better than those fed with sundried leaf meal alone. Medicinal plants have been used in various traditional systems as they have immune potential against numerous diseases. In the present investigation, utilization of different feed on normal fish *Labeo rohita* have been studied for 120 hours.

## MATERIALS AND METHODS

### Collection and maintenance of the experimental animal

The freshwater fish *Labeo rohita* were collected from the VGM fish farm located in Kurinjipadi, Cuddalore district. The fish were brought to the laboratory and transferred to the rectangular cement tanks (100 × 175) of 500 liters capacity containing chlorine free aerated well water, fishes of the same size and weight were used irrespective of their sex for the experiments.

**Fig: 1 *Cardiospermum halicacabum***

**Collection and preparation of *Cardiospermum halicacabum* pellets**

The dried *Cardiospermum halicacabum* was collected from thiruvenkadu Village near to Chidambaram. The *Cardiospermum halicacabum* powder was kept in carefully. Dried *Cardiospermum halicacabum* (Figure 1) powder weight at 50g and rice brand powder was weight at 50 g both the powders mixed well then add sterilized water make titer paste. After this paste to make pellets (1gram ±) according to fish feed (artificial feed) size. Pellets were dried inside the room at normal temperature and avoid the direct sun light. Pellets were packed airtight bottle for experimental use.

**Experimental design**

The feeding experiments were conducted in 2 large drainable outdoor cement cisterns of 100 × 175 m capacity each in a completely randomized design(Figure 2). There were two replications for each treatment. To each of these cisterns, samples of 6 fish each (70-80 g live weight and 14-16 cm length), segregated from the acclimatization tank were transferred after measuring the length and weight. To each treatment the fish were fed at 10% of their body weight daily, which was split into two equal ratios.

**Fig: 2 *Labeo rohita***

**Diets**

Appropriate quantities of finely powdered ingredients were weighted and mixed thoroughly by adding water. The dough thus prepared was under the shady place or room temperature. The extruded pellets were dried overnight. Proximate analyses of diets were carried out using standard methods.

**Sampling and growth studies**

The duration of feeding experiment was 120 hours. The specimens were sampled once in every 24 hours and a minimum of 3 fish were collected from each cistern and length and weight was recorded for studying growth. Specific growth rate (SGR) was calculated as,

$$SGR = \frac{\text{Log e } W_2 - \text{log e } W_1}{T_2 - T_1} \times 100$$

Where W1 is the weight (g) of fish at time T1 and W2 is the weight at time T2.

**Feed utilization and nutrient digestibility**

To study the feed utilization of *Labeo rohita* short term experiments were conducted in laboratory in cement tanks of 100 litre capacity employing 6 fish from each treatment for 120 hours. There were three replicates for each treatment. The weighed feed was supplied to fish in petri dish at 10% of their body weight. The unconsumed feed, if any, was siphoned out 24 hr after feeding. Likewise, faecal matter was also siphoned out the next day prior to the next feeding. The unconsumed feed and fecal matter was oven dried at 60°c weighed and kept in a desiccator for proximate analysis. According to Halver's procedures, feed conversion ratio, feed conversion efficiency, assimilation efficiency and nutrient digestibility were calculated.

**RESULTS:**

At the end of the experimental period, there have been significant differences in final average weight,

Food Conversion Ratio (FCR), Food Conversion Efficiency (FCE) and Food Assimilation Efficiency (FAE) etc. of fishes (group I and II) with feed 1and 2. Fish fed with feed 1and 2 have shown significant changes in FCR, FAE, etc. Among the fish fed with feed 1and 2, the highest specific growth rate (19.6) has been recorded for feed 2 (*C. halicacabum* leaves mixed feed) when compared to the feed 1 (leaves mixed feed) (16.8) (Table 2). Similarly the highest feed consumption, the highest food conversion efficiency and food assimilation efficiency ratio have been recorded for feed 2 compared with feed 1.

| **Parameters** | **Feed 2 (*Cardiospermum halicacabum* leaves) (Group II)** |
|---|---|
| Initial weight (g) [$W_1$] | 77.36 ±1.93 |
| Final weight (g) [$W_2$] | 78.34 ±1.95 |
| Production [$P=W_2-W_1$] | 0.98 ±0.02 |
| Feed consumption (g) [c] | 2.2 ± 0.05 |
| Faecal output (g) [F] | 0.03 ± 0.01 |
| Relative Growth rate [$P/W_1$] | 1.2 ± 0.03 |
| Assimilation [A=C-F] | 1.98 ± 0.04 |
| Metabolism (g) [R=A-P] | 1.14 ± 0.02 |
| Food conversion ratio [FCR=C / P] | 2.3 ± 0.05 |
| Food assimilation efficiency [FAE =A / C x 100] | 99 ± 2.57 |
| Specific growth rate (SGR) (%) | 19.6 ± 0.50 |

## DISCUSSION:

In the present study, fish (fed with feed 1) show a decrease in food utilization and reduced specific growth rate fed with feed 1 when compared to fish fed with feed 2. Aquatic farm contains fish and other organism. But the fish is mostly affected by pesticide residuals [4].A decrease in feed intake and protein digestibility has been reported in goldfish exposed to waterborne diseases [21]. A decrease in the rate of absorption and feeding is observed in catfish reared in ambient mercury [22]. Reduced food intake has also been reported in Atlantic salmon exposed to zinc [23] . In the present study, fish fed with feed 1 group shows a subsequent decline in the rate of feeding followed by increased food conversion ratio (FCR) compared to fish fed with feed 2. Similar findings of reduced growth and raised food conversion ratio (FCR) have been observed in goldfish exposed cadmium levels in water. Earlier studies [24] show growth stimulation in fish under long-term exposure to bleach kraft mill effluents (BKME). The authors find it possible that constituents of BKME in subinhibitory amounts, upset the hormonal balance or metabolism of fish, thereby increasing food conversion efficiency and stimulating growth. They have further reported that acceleration in growth depends on the way of energy distributed and utilized within the body. Pandey *et al*. [25] have reported the lowest feed conversion ratio and the weight gain, feed conversion efficiency and protein efficiency ratio in *Cirrinus mrigala* fed with lower doses of thyroxine supplemented diet. Further, they have reported that higher doses of thyroxine in supplementary diet exhibit reduced growth. In the present study, fish *Labeo rohita* fed with feeds 2 showed better response in feed utilization than in feed 1. Plant-based remedies have always been an integral part of traditional medicine throughout the world. Pandey *et al*. [25] and [13] have observed the enhanced growth in *Catla catla* and *Labeo rohita* fed with supplementary diets containing 5 percent lysine and methionine. The present study reveals that *Labeo rohita* fed with feed 2 records better weight gain in comparison to those kept on feed 1.

The result of present study are comparable to those of [26]on *Tilapia zilli* and Johny *et al*. (2000) on *Oreochromis niloticus*. Supplementary feeds with lysine and methionine (about 0.5%) enhance growth in *Hypophthalmichthys molitrix* [27]and *Heteropneustes fossilis* under field conditions [27] have reported that fish *Cyprinus carpio* receiving diet containing livol at 1% showed significantly higher growth Specific Growth Rate (SGR) and Food Conversion Efficiency (FCE). They have further reported that at the highest dietary level of livol (1.5%) growth recorded was lower and comparable

with control growth. The findings of the present investigation suggest that feed 2 showed better feed utilization than feed 1.

A number of phytochemicals which act as powerful antioxidants are present in fruits, vegetables and other plant species. Fruits and vegetables are believed to be protective foods because they supply sufficient quantities of minerals and vitamins which perform not only basic nutritional role in the animal body but also help in reducing the risk of several chronic diseases as they contain some non-nutrient bioactive substances. Various parts of fruits, vegetables species and herbs have been used in Ayurvedic system of medicine since ancient times to cure human and animal ailments. Papathi and Samuel Paulraj [28] have found that the low cost feed leaf powder of different wild plant species incorporated with the diet of *Cirrinus mrigala* increase the growth of the fish.

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