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Nutritional and Biochemical Assessment of *Labeo rohita* Fingerlings Fed with *Pistia stratiotes* and *Salvinia molesta*

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Abstract : Studies on *Labeo rohita* aquaculture require extensive morphometric analysis, nutritional profile, and activity of digestive enzymes under formulated aqua diets containing aquatic plants like *Pistia stratiotes* and *Salvinia molesta*. Such queries require extensive morphometric and nutritional analysis, including tissue analysis for considering biochemical changes due to variation in diet. Investigation of the activity of digestive enzymes provides useful information on critical enzymatic processes required for digestion in *Labeo rohita*. The pivotal role of aquaculture in world food production underscores the significance of solving problems such as hydrodynamics, feed quality, and species selection. Morphometric analysis facilitates the understanding of growth patterns and gene diversity, while nutritional analysis informs the development of well-designed feeds. The dominance of Rohu in carp polyculture systems underscores its importance, and the need for sustainable aquaculture practice requires it. Through research, scientists seek to accelerate aquaculture efficiency and augment sustainable practice in *Labeo rohita* production.

IndexTerms **-**Aquaculture; Digestive enzyme activities; *Labeo rohita* ; Morphometric analysis; Nutritional content; Polyculture systems; Prepared Aqua feeds.

I. INTRODUCTION

This study provides a comprehensive analysis of *Labeo rohita* in aquaculture, including morphometric characteristics, nutritional value, and digestive enzyme activities. These aids in assessing the growth pattern, genetic variation, and physiological response to feeding conditions for sustainable aquaculture production. Morphometric analysis, where there is accurate measurement of surface characteristics, aids in assessing the growth pattern and possible genetic variation in *Labeo rohita* (FAO, 2020). Analysis of nutritional value investigates protein, lipid, carbohydrate, vitamin, and mineral content, which aids in the formulation of balanced diet for optimal growth and health (Tacon & Metian, 2020). The measurement of digestive enzyme activity provides information on enzymatic activities essential for nutrient assimilation that aids in the formulation of feeds compatible with the digestive capacity of the fish (Kumar *et al.*, 2021). As a global importance is placed on the aquaculture industry and its vulnerability to external events like climatic variability and feed availability, comprehensive research is essential towards increasing efficiency in production. Advances in aquaculture technology since the 1960s, especially in water quality management and optimum feed, have greatly increased in enhancing production levels (FAO, 2020). As a major aquaculture species in freshwater aquaculture production, *Labeo rohita* is part of a polyculture system, where species choice directly influences productivity as well as efficiency in feed utilization (Azim & Little, 2021). Polyculture practices maximize the use of food resources, maximizing growth as well as profitability in commercial aquaculture production systems (Das *et al.*, 2022).This study also investigates the feeding of aquatic weeds, *Pistia stratiotes* and *Salvinia molesta*, and their effects on morphometric characteristics, nutritional contents, and digestive enzyme activities of *Labeo rohita* (Kumar *et al.*, 2023). Focusing on the functions of proteins and lipids in fish nutritional ecology, the study compiles their functions in development, sustaining well-being, and stress (Ali & Jauncey, 2023). Overall, these studies provide pertinent information on the physiological characteristics of *Labeo rohita* in aquaculture, including morphometric characteristics, nutritional composition, and enzymatic digestion. The results enable the optimization of feed composition, species selection, and sustainable production practices, and thus enhance efficient and environmentally sound aquaculture management.

2.Materials and Methods

Fish Acclimation

Labeo rohita fingerlings were acclimatized in 15 days in tanks on rice bran and groundnut oil cake diet. Basal ingredients were ground in a micro pulverizer and mixed as per Pearson Square method to obtain a 50% protein feed mix. The feed mix was steam-cooked at 95-100ºC for five minutes, cooled, and fortified with *Pistia stratiotes* and *Salvinia molesta* extracts (50% each) prior to pelletization. Binding was with tapioca flour, and the feed mix was prepared in an Idiyappam kulal with a 3 mm die. The pellets were sun-dried to less than 10% moisture, examined for uniformity, color, and odor, and proximate composition analyzed before use in fingerling feeding trials.

S.No	**Ingredients**	Control (g)	Diet 1 (g)	Diet 2 (g)
1	Soyabeanmeal	24.76	17.75	16.82
2	Groundnutoilcake	24.76	17.75	16.82
3	Wheat flour	24.76	17.75	16.82
4	Maize flour	8.56	7.25	10.88
5	Tapioca flour	8.56	7.25	10.88
6	Rice bran	8.56	7.25	10.88
7	Citric acid	0.10	0.10	0.10
8	*P.stratiotes*	-	17.75	-
9	*S.molesta*	-	-	16.82
S.NO	**TOTAL**	**100**	**100**	**100**

Experimental Design

Fingerlings were randomly assigned to three dietary groups (3 replicates/group, 20 fish/replicate):

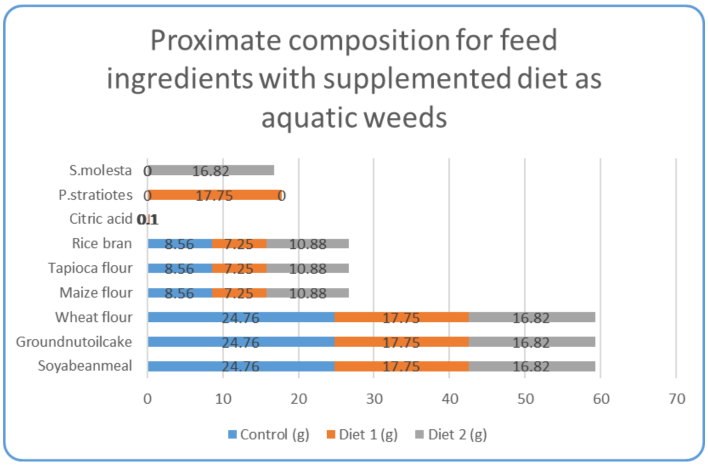
Group I: Fish in the control group were provided with a standard diet.

Group II: Fish in the experimental group were fed a specialized diet enriched with *Pistia* Leaves Powder.

Group III: Fish in another experimental group were nourished with a specialized diet incorporating *Salvinia* Leaves Powder.

Morphometric characteristics such as total length, standard length, and girth were measured during the experiment according to the procedure given by Munshi and Srivastava (1988). Several parameters like survival rate, condition factor, weight gain, specific growth rate, feed conversion ratio, protein efficiency ratio, and biochemical composition of fish tissue were calculated at the end of the experiment. Protein was estimated by the method of Lowry *et al.* (1951), carbohydrate by the method of Roe (1955), and lipid by the method given by Folch *et al.* (1957). The activity of digestive enzymes was also estimated for 30 days, i.e., protease activity by Anson (1938), amylase activity by Bernfeld (1955), and lipase activity by Borlongan (1990). Statistical analysis was performed by using the Student's t-test on SPSS software for comparing the control and treatment groups.

Proximate composition for feed ingredients with supplemented diet as aquatic weeds



Experimental Arrangement

Fingerlings were allocated randomly into three groups, each replicated three times, encompassing 20 fingerlings per group (n = 20 fingerlings/group). They were provided with diets comprising 50% concentrations of each aquatic weed, subsequently referred to as 50% *P. stratiotes*, 50% *S. molesta*, and the control, respectively.

Group I - Administered a control diet exclusively formulated from basal ingredients.

Group II - Supplied with feed containing a 50% supplementation of *P. stratiotes* aquatic weeds.

Group III - Supplied with feed containing a 50% supplementation of *S. molesta* aquatic weeds.

PLATE – I

Labeo rohita

PLATE – II

Salvinia molesta

PLATE – III

Pistia stratiotes

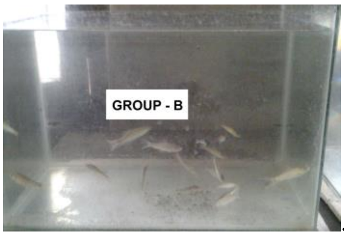
PLATE - IV

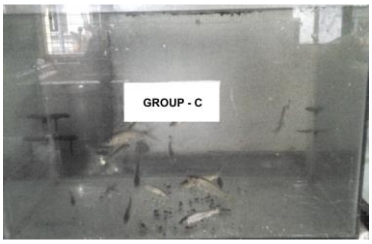
Prepared Control Feed.

Prepared *Salvinia* Feed

Prepared *Pistia* Feed

PLATE – V





Experimental setup

Group A : Fish in the control group were provided with a standard diet.

Group B : Fish in the experimental group were fed a specialized diet enriched with *Pistia* Leaves Powder.

Group C : Fish in another experimental group were nourished with a specialized diet incorporating *Salvinia* Leaves Powder.

3.RESULT AND DISCUSSION

Morphometric

The findings revealed that the *Labeo rohita* fed with 50% *Pistia stratiotes* (PS)-containing diets had the greatest growth in length, weight, standard length and girth. Precisely, the final length, weight, standard length, and girth of the fish in the PS diet treatment were 8.6±0.83 cm, 6.25±1.47 g, 7.0±0.66 cm, and 1.5±0.08 cm, respectively. The fish fed with the 50% *Salvinia molesta* (SM) diet had lower growth with final length of 8.5±0.90 cm, weight of 5.50±1.00 g, standard length of 6.8±0.83 cm, and girth of 1.4±0.13 cm. The control group, which was not fed with aquatic weed, had lower growth rates (final length of 8.2±0.96 cm, weight of 5.35±1.01 g, standard length of 6.6±0.83 cm, and girth of 1.3±0.12 cm). Statistically, the control group and experimental treatments were significantly different ($P<0.05$), while there were no significant differences in the weight and standard length of fish fed on the PS and SM diets ($P>0.05$). In survival, there were high survival rates in all treatments at trial end. Survival rate of the *Labeo rohita* fed with 50% PS and 50% SM diets was 100% (±0.0%). The control diet group also had a high survival rate of 98.33% (±1.44%). Survival rates, however, were not significantly different between the experimental and control groups ($P>0.05$). Lastly, *Labeo rohita* reared on aquatic weed-based diets *Pistia stratiotes* (PS) and *Salvinia molesta* (SM)) showed better growth performance compared to the control group, thus proving the effectiveness of these diets in promoting both the growth and survival of the species (Fig.1). Weight-length relationship is crucial in fish growth measurement because it allows for estimation of weight from length and estimation of the condition factor, which is a measure of fish health or fatness (Wootton, 1990; Khan *et al.*, 2024). The current study entailed determination of different morphometric indices (total length, standard length, girth, and weight) of *Labeo rohita* following exposure of the species to *Pistia stratiotes* (PS) and *Salvinia molesta* (SM) diets. Despite the absence of differences in girth or length between the control and experiment groups, both PS and SM diets achieved promising trends in growth, indicating their effectiveness in promoting fish size and general well-being.*L. rohita* fed 50% PS had the highest weight (6.25g), followed by 50% SM (5.50g) versus the control (5.35g). This indicates that aquatic weed-based diets are effective in promotion of growth in L. rohita, with PS being the most effective, confirming research by Sullip et al., (2006) on the viability of using aquatic plants in fish farming for biomass production. The findings also confirm more recent research on the nutritional efficiency of plant-based diets for aquaculture fish, especially in terms of increased growth and health markers (Singh et al., 2023).

NUTRITIONAL INDICES

The condition factor (CF) was lower in *L.rohita* fed with 50% *Pistia stratiotes* (PS) (0.88±0.01) and 50% *Salvinia molesta* (SM) (0.95±0.03) than in the control group (0.97±0.01), with significant differences ($P<0.05$). Specific growth rate (SGR) was highest in the 50% PS group (1.12±0.33%), followed by the 50% SM group (0.91±0.34%), and the control group had the least (0.58±0.07%), though differences were not significant ($P>0.05$). Weight gain was highest in the 50% PS group (2.50±0.05g), followed by the 50% SM group (1.72±0.02g) and the control group (1.57±0.03g), with significant differences ($P<0.05$). Feed conversion ratio (FCR) was lowest in the 50% PS group (0.88±0.06), followed by the 50% SM group (0.95±0.11), and the control group had the highest (1.06±0.00), though differences were not significant ($P>0.05$). The protein efficiency ratio (PER) was highest in the 50% PS group (1.13±0.07), followed by the 50% SM group (1.04±0.12), and the control group (0.92±0.00), though differences were not significant ($P>0.05$) (Fig. 2). In this study, *Labeo rohita* showed maximum growth, condition factor (CF), specific growth rate (SGR), weight gain, feed conversion ratio (FCR), and protein efficiency ratio (PER) when fed with a diet containing *Pistia stratiotes* (diet 1), compared to a diet with *Salvinia molesta* (diet 2) and the control feed. Growth involves changes in length, weight, volume, or mass, and variations in lipids, proteins, or other chemical constituents of the body. These results conform to earlier studies suggesting dietary protein content significantly affects growth performance in *L. rohita,* with optimal levels reported between 30% and 35% crude protein (Gangadhara *et al.*, 1997; Rengacharyulu *et al.*, 2000; Paul and Mohanty, 2002; Singh *et al.*, 2006). Notably, the highest growth rates were observed in diets with 45% *Pistia stratiotes* meal inclusion, with performance declining at higher inclusion levels (Bose *et al.*, 2021; Saha *et al.*, 2022). SGR values for diet 1 increased from 0.60% at 10 days to 1.12% at 30 days, whereas diet 2 showed an increase from 0.47% to 0.91% over the same period, both outperforming the control diet (Majhi *et al.*, 2006; Dhawan and Kaur, 2002; Ray and Patra, 1989). Weight gain was highest in the diet 1 group (2.50±0.05g), followed by diet 2 (1.72±0.02g), and the control diet (1.57±0.03g), highlighting the efficacy of Pistia stratiotes in promoting weight gain (Suresh and Mandal, 2000; Majhi *et al.*, 2006). FCR values were 0.88g for diet 1 and 0.95g for diet 2, both lower than the control diet, indicating better feed utilization (Patnaik et al., 1991; Ali *et al.*, 2010). PER was highest in diet 1 (1.13g), followed by diet 2 (1.04g), with the control diet at 0.92g, reflecting efficient protein utilization in diets containing *Pistia stratiotes* (Rice, 1994; Ray and Das, 1995). These results underscore the potential of *Pistia stratiotes* as a valuable feed ingredient for enhancing the growth and health of *L. rohita* in aquaculture.

Protein

The findings revealed a high rise in protein in different fish tissues fed experimental diets compared to the control group. Muscle tissue contained the highest amount of protein (137.73 ± 3.06 mg/g) in fish fed *P. stratiotes*. Liver (102.83 ± 0.58 mg/g), kidney (94.97 ± 0.53 mg/g), gill (97.32 ± 0.39 mg/g), and brain (130.32 ± 0.70 mg/g) exhibited remarkable protein deposition, with the best performances obtained with *P. stratiotes*. Statistical evaluation revealed noteworthy differences ($P<0.005$) among all the tissues being investigated. The conclusion is that *P. stratiotes* is a very effective food protein for the promotion of growth and nutritional improvement of *Labeo rohita* fingerlings. Protein is used in fish growth, metabolic activities, and tissue synthesis, and its optimal utilization in aquaculture is of significant importance (Li *et al.*, 2023; Wu *et al.*, 2022). The present study found that the muscle tissue had the most protein content, corroborating other studies showing that high-protein diets are essential for protein deposition (Zhang *et al.,* 2021; Kim *et al.,* 2020). Surprisingly, the inclusion of *Pistia stratiotes* (Diet-1) optimized protein retention more than *Salvinia molesta* (Diet-2) and the control diet (Adeparusi & Ajayi, 2018). This agrees with previous research that had indicated that the inclusion of aquatic plants like *Pistia stratiotes* in the diets of fish would enhance growth performance and nutrient utilization (Hossain *et al.*, 2019). For example, in a study, it was discovered that substitution of partial fishmeal with *Pistia stratiotes* meal in the feed of *Labeo rohita* fingerlings resulted in improved weight gain and feed conversion ratios (Siddiqui *et al.,* 2020) (Fig.3). Likewise, in a study with Clarias gariepinus juveniles, it was revealed that feeds containing *Pistia stratiotes* leaf meal had superior growth performance and protein efficiency ratios (Olapade *et al.,* 2021). The findings of this research support the use of aquatic plants as sustainable sources of protein in fish diets to promote growth and feed efficiency in aquaculture production.

Carbohydrates

The liver had the maximum carbohydrate content with *L. rohita* individuals of Diet-1 (50% PS) having the maximum value of 34.20±0.04 mg/g, followed by the control group at 24.64±0.09 mg/g and Diet-2 at 26.37±0.14 mg/g. The gills had the second maximum carbohydrate content, with 26.84±0.04 mg/g in Diet-1, followed by the control group at 18.15±0.06 mg/g and Diet-2 at 21.10±0.11 mg/g. The kidneys also had maximum carbohydrate content, where 26.05±0.17 mg/g was noted in Diet-1, while the control and Diet-2 groups had 17.81±0.06 mg/g and 19.50±0.11 mg/g, respectively. In the muscle tissue, the carbohydrate content was 21.54±0.07 mg/g for Diet-1, compared to 17.41±0.16 mg/g for the control and 17.65±0.06 mg/g for Diet-2. The brain had relatively lower levels of carbohydrate accumulation, with 17.76±0.16 mg/g recorded in Diet-1, while the control and Diet-2 recorded 17.65±0.06 mg/g and 17.67±0.06 mg/g, respectively. Generally, the liver had the maximum carbohydrate content, followed by the gills and kidneys, and Diet-1 (50% PS) always had higher carbohydrate accumulation than the control and Diet-2 (50% SM). The carbohydrates are a significant energy source in fish, and they influence protein preservation, development, and feed efficiency (Tiwari & Singh, 2006). Despite the fact that fish do not have a rigid requirement for carbohydrates, maximum dietary levels may avoid excessive breakdown of protein and maximize metabolic efficiency (Wilson, 1994). The carps, such as *Labeo rohita*, can utilize carbohydrates up to 43% of their diet without any adverse effects (Mohapatra *et al.,* 2002; Misra *et al.,* 2006). Dietary excess carbohydrates, however, may reduce growth and reduce feed conversion efficiency (Gumus & Ikiz, 2009) (Fig.4). In this study, diet 1 (50% PS) resulted in increased carbohydrate deposition in all tissues, in particular the liver, followed by muscle. Similar trends have been reported in other species, as high dietary carbohydrates influence hepatic glycogen storage and metabolic pathways (Panserat *et al.,* 2021). High intake of carbohydrates has been shown to inhibit gluconeogenic enzyme expression, promoting energy efficiency (Panserat *et al.,* 2002). More recent studies indicate that optimization of carbohydrate composition in aquafeed formulations is to blame for achieving maximum nutrient retention and sustainable aquaculture (Zhang et al., 2023; Li *et al.,* 2022).

Lipids

The lipid content in various tissues of *Labeo rohita* (*L. rohita*) fed different diets showed significant differences across the experimental periods. Among all tissues, liver (L) exhibited the highest lipid content, followed by brain (B), muscle (M), gills (G), and kidney (K) in descending order. In liver tissue, diet 1 (50% PS) led to the highest lipid content of 8.57±0.17 mg/g, significantly higher than the control (2.13±0.02 mg/g) and diet 2 (50% SM, 2.18±0.02 mg/g) groups ($P<0.001$). The brain also showed considerable lipid accumulation, with diet 1 (50% PS) resulting in 14.68±0.03 mg/g, compared to the control group (2.24±0.01 mg/g) and diet 2 (10.03±0.02 mg/g), with significant differences ($P<0.003$). For muscle tissue, diet 1 (50% PS) resulted in a lipid content of 4.42±0.03 mg/g, while diet 2 (2.96±0.03 mg/g) also significantly increased the lipid content over the control group (1.86±0.01 mg/g, $P<0.002$). In gills, diet 1 (3.7±0.02 mg/g) again showed the highest lipid accumulation, significantly greater than the control (0.93±0.02 mg/g) and diet 2 (1.88±0.02 mg/g) ($P<0.004$). Lastly, kidney tissues exhibited the lowest lipid content, with diet 1 (2.31±0.02 mg/g) significantly higher than both the control (1.33±0.01 mg/g) and diet 2 (1.75±0.04 mg/g) groups ($P<0.003$) (Fig.5). Thus, the pattern of lipid accumulation across tissues followed the sequence L > B > M > G > K. Lipids are the primary energy source for fish, providing a dense and easily digestible form of energy that surpasses carbohydrates. They are stored in adipose tissues, notably in the liver, muscle, and mesenteric fat. Lipid metabolism is integral to energy allocation, influencing growth, development, and overall metabolic functions in fish. Recent studies have demonstrated that dietary lipid levels significantly affect lipid metabolism and storage in various fish species. For instance, research on Nile tilapia (*Oreochromis niloticus*) revealed that fish fed high-fat diets accumulated more lipids in adipose tissues, whereas those on low-fat diets enhanced hepatic fatty acid biosynthesis to maintain lipid homeostasis (Physiology Reports, 2023). Similarly, in large yellow croaker (*Larimichthys crocea*), dietary supplementation with *L-carnitine* was found to reduce liver lipid content by promoting fatty acid β-oxidation and alleviating endoplasmic reticulum stress (British Journal of Nutrition, 2023). These findings underscore the importance of dietary lipids in modulating lipid metabolism and storage, which are crucial for the physiological state and metabolic activity of fish.

Digestive enzymes

After a 30-day feeding trial, the activities of digestive enzymes in Labeo rohita showed significant variations in accordance with dietary composition. Highest protease activity was noticed in 50% PS-fed (1.48±0.03 u/mg protein), followed by 50% SM-fed (1.43±0.02 u/mg protein), and lowest in control (1.07±0.04 u/mg protein), with significant differences between control and experimental groups ($P<0.05$). The same trends were noticed in amylase activity, which was highest in 50% PS-fed (1.49±0.03 u/mg protein), followed by 50% SM-fed (1.14±0.03 u/mg protein), and lowest in control (0.85±0.09 u/mg protein), with statistical significance ($P<0.05$) except between 50% SM and control groups. Lipase activity was highest in 50% PS diet (2.87±0.06 u/mg protein), followed by 50% SM diet (2.13±0.54 u/mg protein) and control (1.64±0.04 u/mg protein), with significant differences observed ($P<0.05$). The results indicate that 50% PS diet increases digestive enzyme activities in *L. rohita*, indicating improved digestion and utilization of nutrients compared to 50% SM and control diets (Fig.6).

Digestive enzyme activity analysis of *Labeo rohita* during a 30-day feeding trial was found to be highly variant as influenced by diet composition. Highest enzyme activity for protease, amylase, and lipase was exhibited by fish fed a diet with 50% plant protein sources (PS), followed by fish fed a 50% soybean meal (SM) diet, and the lowest among the control group. In particular, highest protease activity was exhibited by the PS group, reflecting more efficient digestion of proteins. This corresponds to studies that have established that increased dietary protein levels can increase protease activity in fish (Debnath *et al.,* 2007). Amylase activity, which is essential for digestion of carbohydrates, was also highly elevated in PS-fed fish, according to studies that have established that herbivorous and omnivorous fish have higher amylase activity than carnivorous fish (Hidalgo *et al.,* 1999). Lipase activity, which is vital for lipid metabolism, was also highest in the PS diet group, according to studies that have established that herbivorous fish have high lipase activities to metabolize lipids from plants efficiently (Nayak *et al.,* 2003). These findings reflect the digestive system adaptability of *L. rohita* to digest plant-based diets and the aquaculture potential of plant-based diets.

4.Conclusion

The present study highlights the value of aquatic macrophytes, i.e., *Pistia stratiotes* and *Salvinia molesta*, as nutrient sufficient and sustainable feed ingredients for *Labeo rohita* fingerlings. Through careful morphometric, nutritional, and enzymatic research, it was clear that incorporation of these macrophytes in the formulated diets did not adversely affect the health or growth of the fingerlings. Their incorporation, however, was seen to positively affect feed utilization, growth performance, and activity of digestive enzymes, thus underlining their value as functional feed additives. The protein quality, fiber, and bioactive molecules in these macrophytes are likely to enhance nutrient uptake and metabolic efficiency, which are of utmost value for the desirable growth of aquaculture species. Further, utilization of these available and often problematic aquatic weeds provides a double dividend—elimination of an eco-unfriendly issue of aquatic weed overgrowth in water bodies and, in the process, reducing the cost of feed production. This approach is consistent with the tenets of sustainable aquaculture by ensuring resource efficiency, environmental responsibility, and cost-effectiveness. The results of this study provide support towards the enhanced utilization of such exotic feed resources, especially in regions where traditional ingredients are scarce or expensive. However, further long-term studies evaluating fish immunity, reproductive performance, as well as flesh quality are recommended to further establish the safety and efficacy of these macrophytes in aquaculture feed formulations. Overall, the present study is a part of the paradigm shift of eco-sustainable aquaculture practice.

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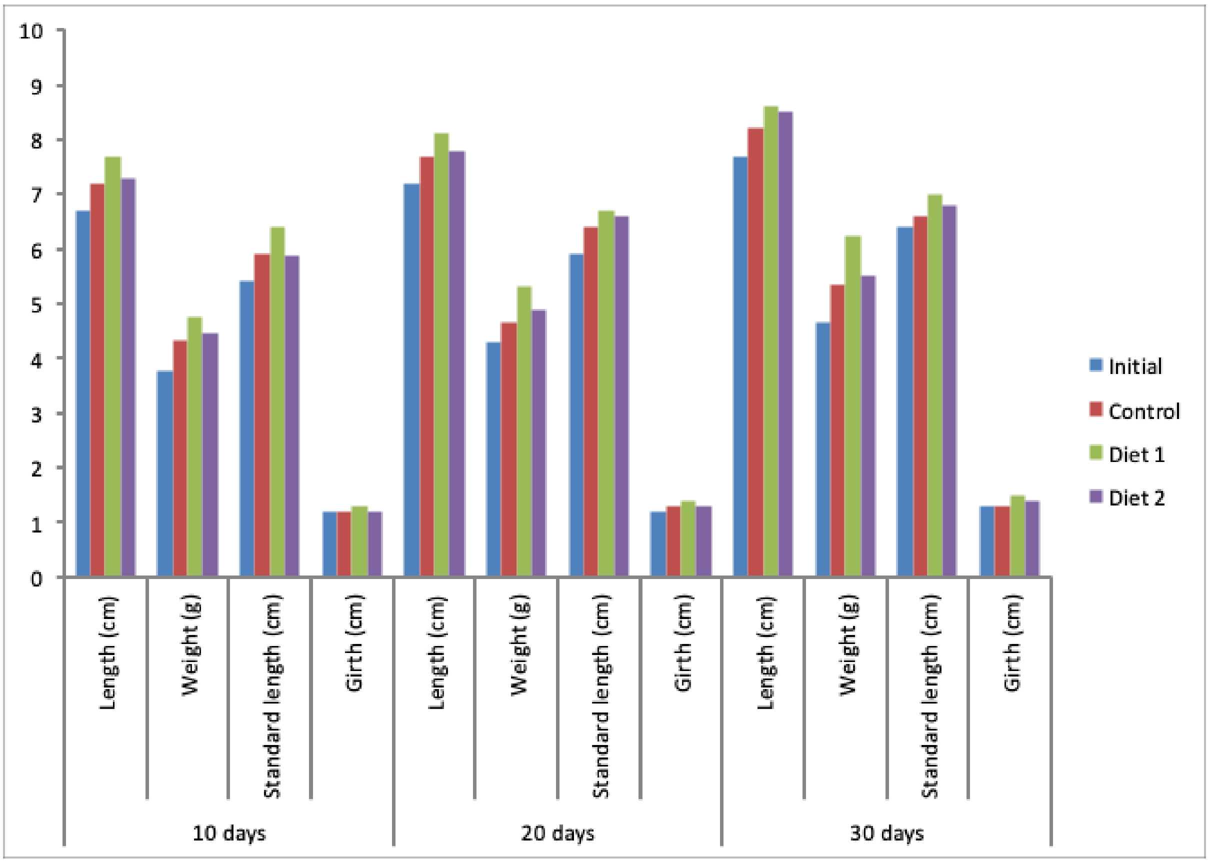
Fig.1 Morphometric data of fish *L. rohita* fed with diets containing aquatic weeds for a period of 10, 20 and 30 days

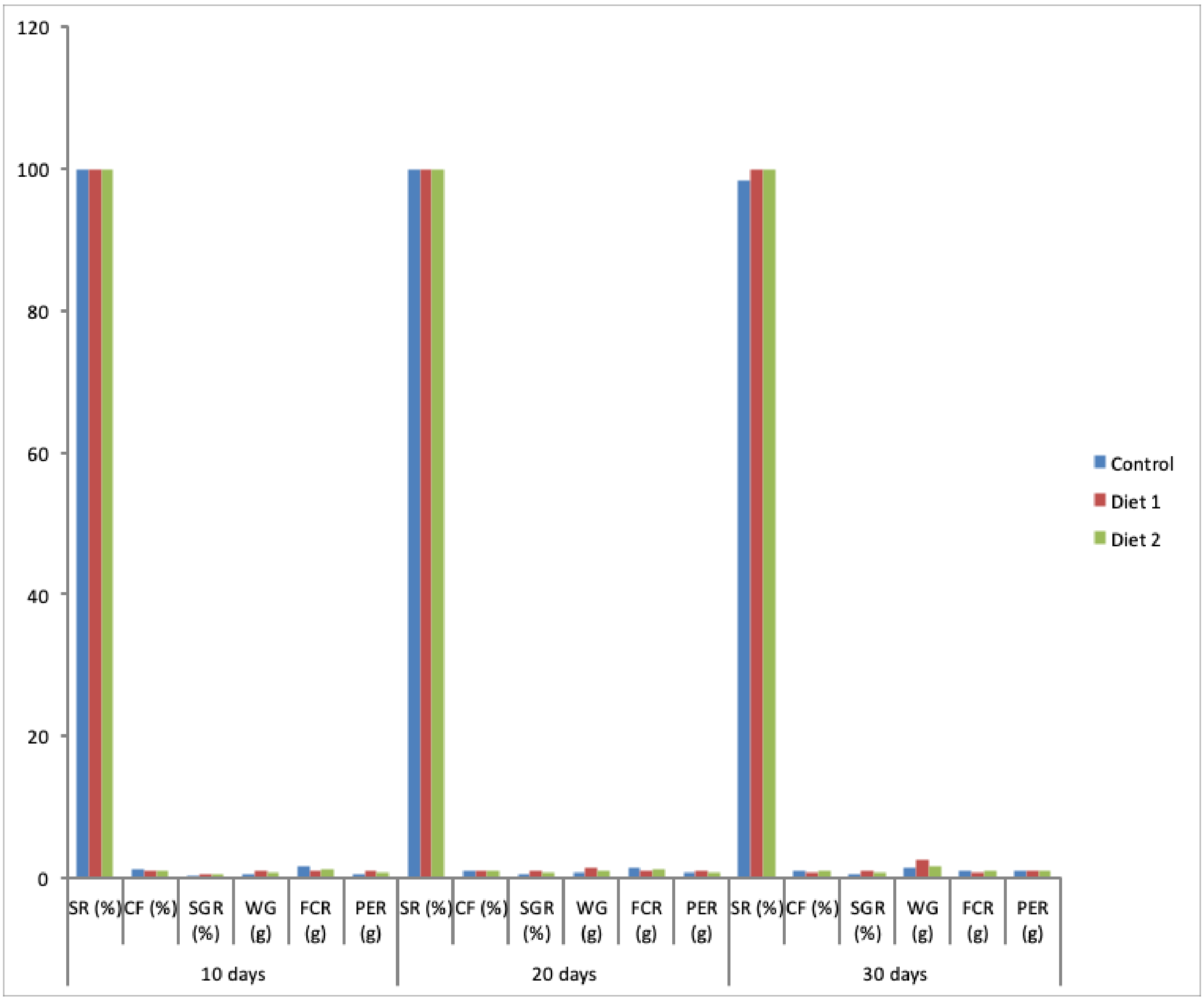


Control - Without aquatic weeds

Diet 1 - Fish fed with *Pistia stratiotes*

Diet 2 - Fish fed with *Salvinia molesta*

Fig.2 Nutritional indices of *L. rohita* fed with diets containing aquatic weeds for a period of 10, 20 and 30 days.

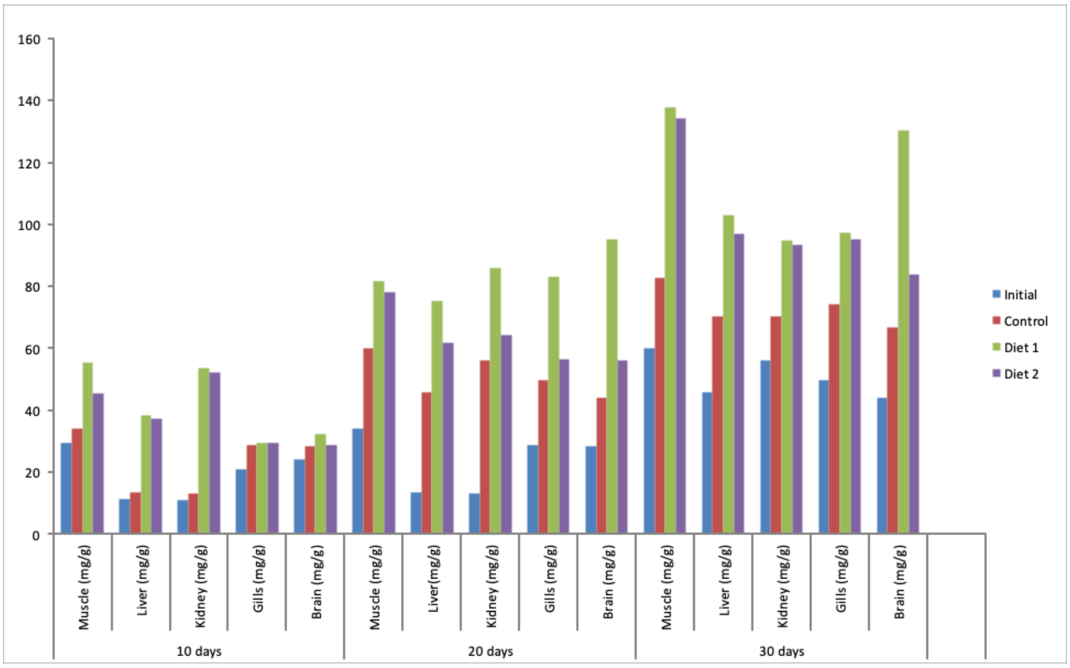


Control - Without aquatic weeds

Diet 1 - Fish fed with *Pistia stratiotes*

Diet 2 - Fish fed with *Salvinia molesta*

Fig.3 Total Protein content of various tissues of fish *L. rohita* fed with diets containing aquatic weeds for a period of 10, 20 and 30 days

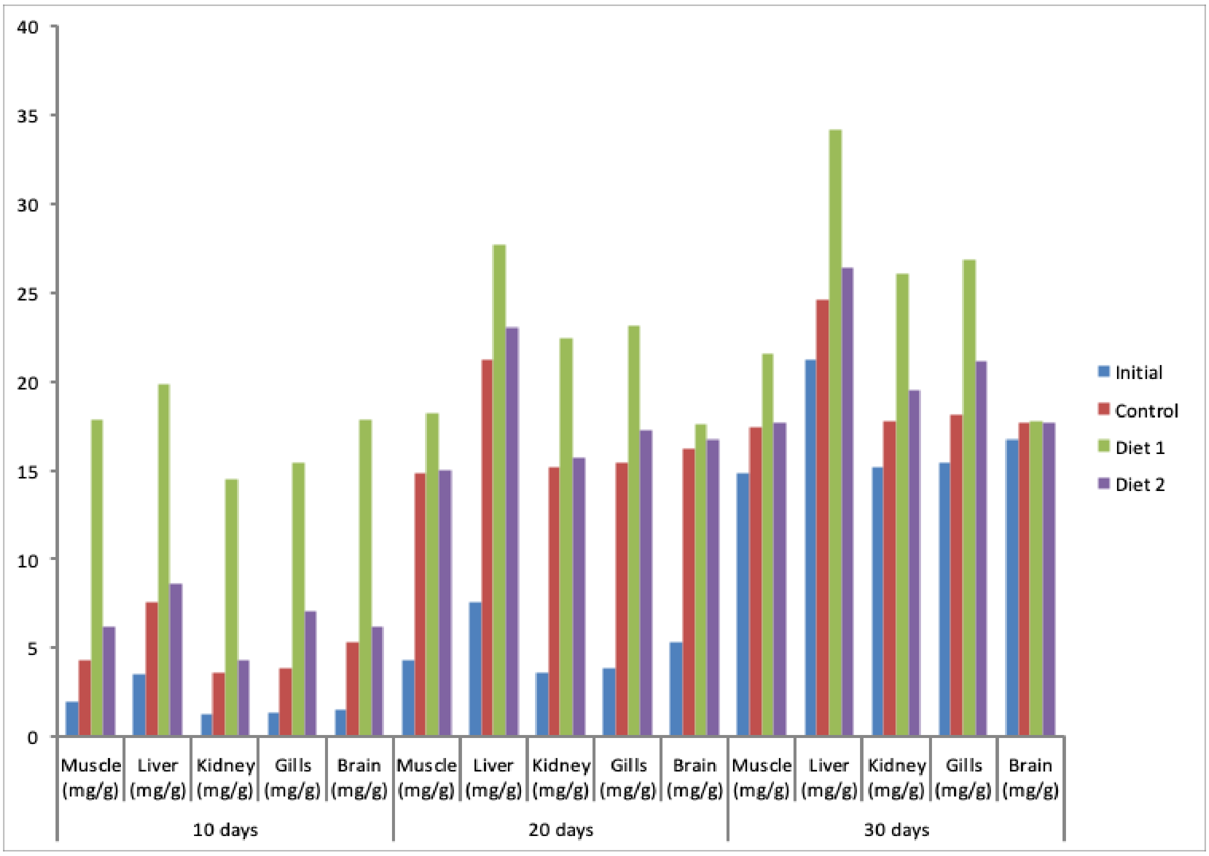


Control - Without aquatic weeds

Diet 1 - Fish fed with *Pistia stratiotes*

Diet 2 - Fish fed with *Salvinia molesta*

Fig.4 Total Carbohydrate content of various tissues of fish *L. rohita* fed with diets containing aquatic weeds for a period of 10, 20 and 30 days

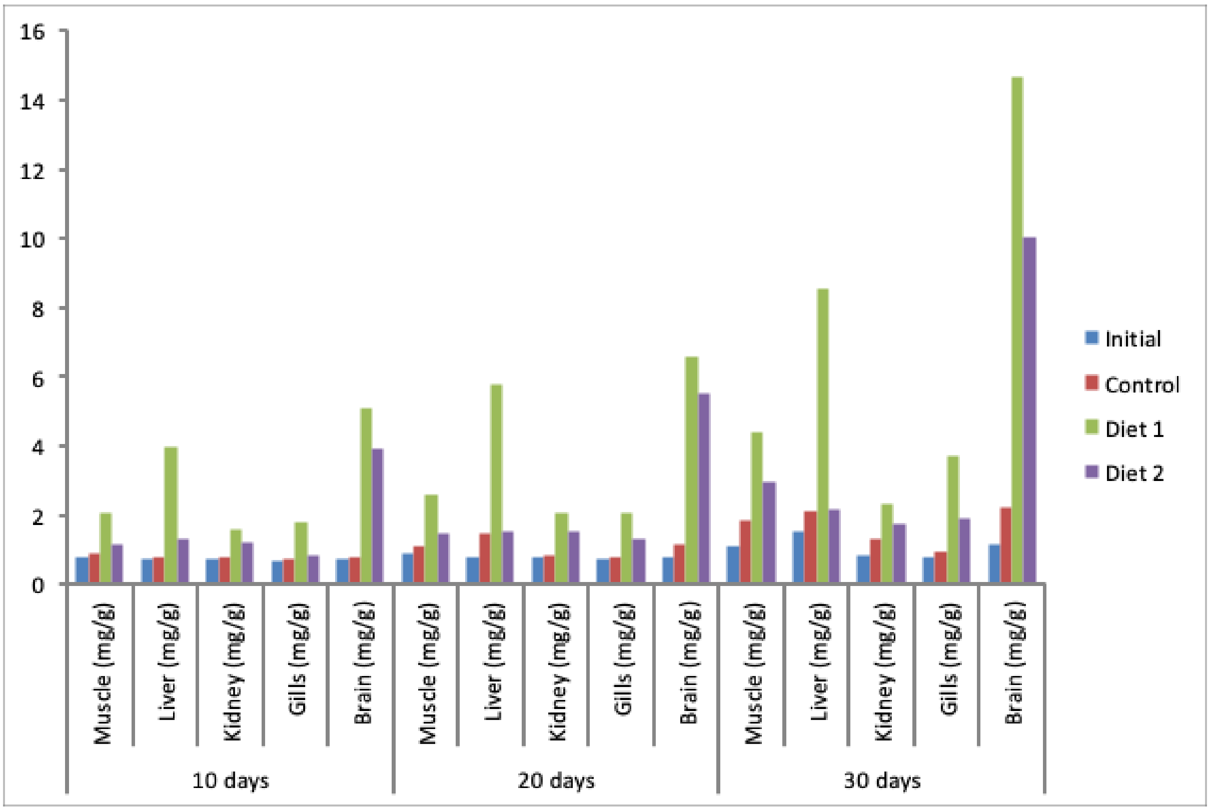


Control - Without aquatic weeds

Diet 1 - Fish fed with *Pistia stratiotes*

Diet 2 - Fish fed with *Salvinia molesta*

Fig.5 Total Lipid content of various tissues of fish *L. rohita* fed with diets containing aquatic weeds for a period of 10, 20 and 30 days

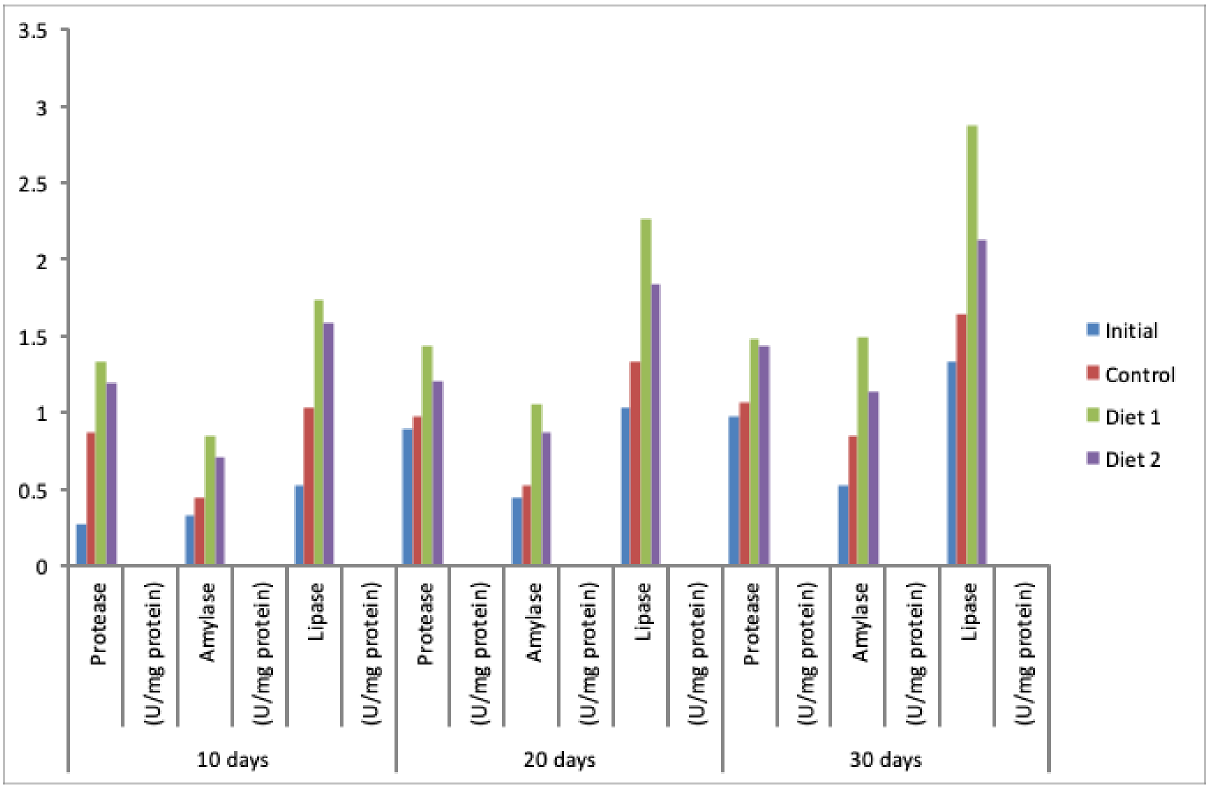


Control - Without aquatic weeds

Diet 1 - Fish fed with *Pistia stratiotes*

Diet 2 - Fish fed with *Salvinia molesta*

Fig.6 Digestive enzymes activities of fish *L. rohita* fed with diets containing aquatic weeds for a period of 10, 20 and 30 days



Control - Without aquatic weeds

Diet 1 - Fish fed with *Pistia stratiotes*

Diet 2 - Fish fed with *Salvinia molesta*