



# Growth Performance of Jayanti Rohu and Amur Common Carp in Extensive Polyculture System

Dipangka Saikia\*, Manoj Kumar Bhuyan and Nilotpal Das

KrishiVigyan Kendra, Kokrajhar, Assam Agricultural University

## ABSTRACT

Composite fish culture, a multi species fish culture technology has extensively been practicing by small and marginal farmers throughout the country. Due to several biotic and abiotic reasons such as inbreeding, improper diet, environmental stress etc. farmers doesn't get satisfactory growth of fishes. Despite of its delicacy, locally available Common carp (*Cyprinus carpio*) due to its bulging abdominal appearance fetches less customer demand. In the present study locally available Rohu (*Labeo rohita*) and Common Carp (*Cyprinu scarpio*) was replaced with improved variety of Jayanti Rohu and Amur Common Carp to evaluate the growth performance as well as the farm economics of the culture system. Three (3) different ponds of farmers of Kokrajhar districts of Assam were selected for the study. Advance fry of Jayanti Rohu and Amur Common Carp were supplied to them from certified seed vendor. In another fish pond locally available Rohu (*Labeo rohita*) and Common Carp (*Cyprinus carpio*) was cultured along with other carps. Fishes were fed with rice polish and mustard oil cake @ 1:1 ratio along with 1per cent vitamin and mineral mixture. Water quality parameters were maintained and health monitoring was practiced by trial netting in every fortnight. The culture practice was repeated for two years. Jayanti Rohu and Amur Common Carp showed a significant higher growth as compared to locally available Rohu (*Labeo rohita*) and Common Carp (*Cyprinus carpio*) in each farmers' pond. Jayanti Rohu and Amur Common Carp also fetched a high market price.

**KeyWords:** Amur Common Carp, Growth performance, Jayanti Rohu, Poly culture.

## INTRODUCTION

The quality of fish protein is high because it contains good amount of amino acids required for good nutrition as well as it provides a of vitamins, minerals and iodine (Edward and Demaine, 1997). Because of population growth, economic development and changes in food habits, demand for fish and fishery products is increasing. Now a days aquaculture is major food producing sector contributing to the National nutritional security, Agricultural export and employment generations.

The state Assam is very rich in terms of fisheries resources witnessing 4820 km of Rivers and Canals, 0.02 lakh ha of reservoirs, 0.23 lakh ha tanks and ponds and 1.10 lakh ha of flood plain lakes (Beels). Despite of having immense potentiality of fish production from these resources Assam is not

self-sufficient to satisfy the demand of the state. Government has taken various policies to increase the fish production of the state time to time. Still Assam has a deficit of 0.35 lakh ton by producing 3.07 lakh ton of fishes against the demand of 3.42 lakh ton. The major culture practiced dominant in Assam is Polyculture of carps. For optimum growth of fishes, the minimum required water temperature is 20°-25°C. But as Assam is situated in the Eastern Himalayan Zone of India, hardly the said temperature remains for 5-6 months only and thus fishes get less growing period.

(Hari and Sagar, 2018) quoted that the local existing stock of common carp in India has several demerits as the fish attains maturity within six months and breeds naturally in the pond. Moreover, common carp also receives less customer

\*Corresponding Author's Email: dipankarsaikia880@gmail.com

demand due to its bulging abdomen and less meat. Hence improved candidate species need to be introduced which can grow at this temperature range and also to increase the scale of production from poly-culture of carps. Amur common carp (*Cyprinus carpio*) is an improved strain of wild common carp of Hungarian origin (Basavaraju *et al*, 2013). It has greater practical significance in low-input aquaculture systems due to its better growth performance, late maturing, hardy, accepts artificial feed and has similar food habit to that of existing stock (Basavaraju and Reddy, 2013). Keeping these in mind the study was conducted to evaluate the growth performance of Jayanti Rohu developed by ICAR-CIFA, Bhubaneswar and Amur Common Carp in carp polyculture compared to existing Rohu (*Labeo rohita*) and Common Carp (*Cyprinus carpio*).

## MATERIALS AND METHODS

The present study was conducted at farmer's field in three locations *viz.*, Chotobinyakhata, Hatigarh and Dhauliguri of district Kokrajhar, Assam with pond size of 1.26 ha, 0.91 ha and 1.04 ha, respectively. Fingerlings (10-15 cm) of Jayanti Rohu and Amur Common carp were supplied to the farmers from certified seed vendor. In all the three locations after liming and fertilization the experimental ponds as well as control ponds were stocked with 8000 numbers of fingerling/ha. Six species *viz.*, Catla (*Catla catla*), Rohu (*Labeo rohita*), Mrigal (*Cirrhinus mrigala*), Silver Carp (*Hypophthal michthys molitrix*), Grass Carp (*Ctenopharyngodon idella*) and Common Carp (*Cyprinus carpio*) were stocked in the control pond. In the experimental ponds Rohu (*Labeo rohita*) and Common Carp (*Cyprinus carpio*) were replaced with Jayanti Rohu and Amur Common Carp. The stocking densities of the ponds are shown in Table 1.

In all the ponds, water quality parameters such as temperature, pH, turbidity, dissolved oxygen (DO) etc. were monitored fortnightly and maintained for better health condition of the fishes. Tray and bag

feeding was practiced to avoid loss of feed as well to prevent deterioration of water quality. Growth of fishes were recorded bimonthly in all the ponds to evaluate the performance of Jayanti Rohu and Amur Common Carp. Final harvesting was done after 11 months of culture. The same practice was continued for 2 successive years. The average body weight gain (ABGW) and the body length increment (cm) was determined.

The data collected were processed for selected statistical parameters (*i.e.* mean, range and standard error) for drawing specific conclusion using data processing software SPSS-19.

## RESULTS AND DISCUSSION

Water quality parameters were found to be in acceptable range throughout the culture periods in both year of culture (Table 2). Although, some fluctuations in water quality parameters were recorded during the experiment, the ranges were suitable for fish culture.

The mean data pertaining to growth of Rohu and Jayanti Rohu are presented in Fig. 1 and 2. In a culture period of 10 months Jayanti Rohu showed a significantly higher growth compared to Rohu (*Labeo rohita*). Rohu recorded highest growth of 590g with an average growth ( $P < 0.05$ ) of  $562.17 \pm 16.85$  g whereas in case of Jayanti Rohu highest recorded growth was 775g with an average growth of  $740 \pm 28.10$ g. The highest length obtained by Rohu and Jayanti Rohu was 27 cm and 32 cm, respectively.

Faster growth rate of Amur common carp was observed by (Hari and Sagar, 2018) in a study compared to other carps in polyculture system. In the present study also significantly higher growth ( $P < 0.05$ ) of Amur common carp was observed in all the three ponds compared to Common carp. In 10 months culture period common carp showed highest growth of 642g with an average growth of  $613.17 \pm 24.25$  g but in same environmental condition and with same quality of diet Amur Common Carp

## Growth Performance of Jayanti Rohu and Amur Common Carp

**Table 1: Stocking of fish fingerlings in control and experimental ponds at farmers field.**

Sr. No.	Name& Address of Beneficiary	Pond Area (Ha)	Fish fingerling stocked (Nos.)					
			Catla (20%)	Rohu/ Jayanti Rohu (25%)	Mrigal (10%)	Silver Carp (15%)	Grass Carp (10%)	Common Carp/ Amur Carp (20%)
1	Chabindra Hajowary, Chotobinyakhata, Kachugaon, Kokrajhar	1.26	2016	2520	1008	1512	1008	2016
2	Dibakar Roy, No1,Hatigarh, Kachugaon, Kokrajhar	0.91	1456	1820	728	1092	728	1456
3	Pranab Kumar Narzary, Dhauliguri, Gossaigaon, Kokrajhar	1.04	1664	2080	832	1248	832	1664

**Table 2: Water quality parameters observed during the culture period.**

Name of beneficiary	Sampling Details for Water Quality Parameters							
	Water Temperature (°C)	Water depth (Meters)	DO (mg/l)	Water pH	CO <sub>2</sub> (mg/l)	Total Alkalinity (mg/l)	Total Hardness (ppm)	Ammonia (ppm)
Chabindra Hazowary	16.0-26.2	0.80-2.0	5.20	7.1-8.3	2.31-2.50	205-218	176.25-185.00	0.03-0.04
Dibakar Roy	15.5- 26.7	0.91-2.3	5.80	7.2-8.4	2.49-2.61	180-202	90.00-123.00	0.03-0.04
Pranab Kumar Narzary	16.0- 27.3	0.74-2.2	5.40	7.2-8.3	1.53-2.23	200-234	120.50-130.00	0.03-0.04

showed highest growth of 1085g with an average growth of  $1005.67 \pm 67.83$  g. Highest recorded length of Amur Common Carp among all the ponds was 35 cm with an average length of  $33.83 \pm 1.16$  cm.

Analysis of the farm economics showed significant ( $P < 0.05$ ) increase in production as well as profit from ponds cultured with Jayanti Rohu and Amur Common Carp. An average of 34.22 per cent increase in annual income was experienced by the all three farmers.

### CONCLUSION

Statistical analysis has shown that the improved

carp varieties Jayanti Rohu and Amur Common Carp were economically viable and also socially acceptable. Incorporation of Jayanti Rohu and Amur Common Carp in extensive poly-culture farming systems was highly advisable to increase the overall production of fish as well as for enhancing the livelihood of the rural small and marginal farmers.

### ACKNOWLEDGEMENT

Authors are thankful to the National Fisheries Development Board, Hyderabad for financial assistance for conducting the study. Authors are also thankful to Assam Agricultural University, Jorhat for support in terms of guidance throughout

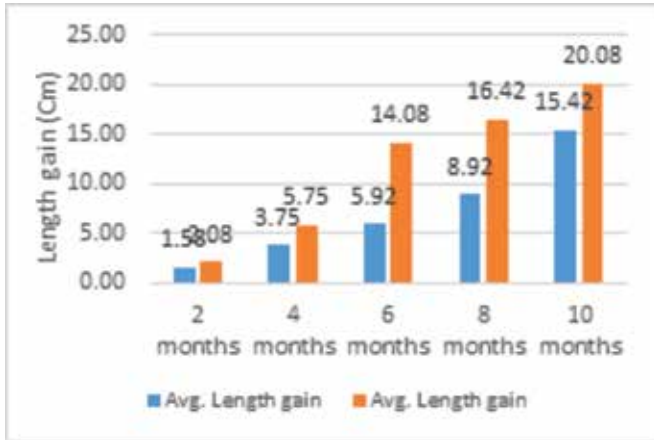


Fig. 1: Avg. Length gain by Rohu and JayantiRohu



Fig. 2: Avg. Weight gain by Rohu and JayantiRohu

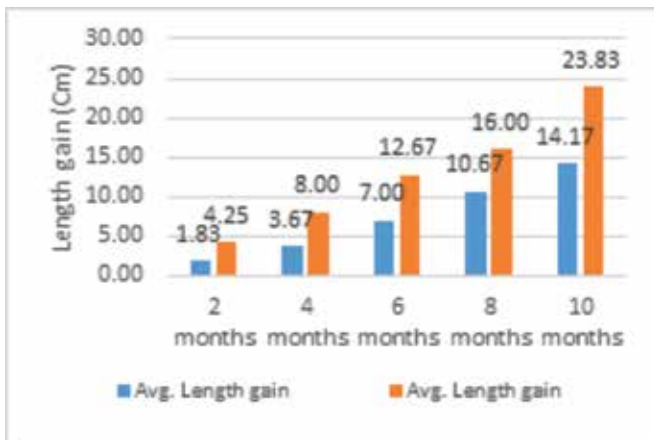


Fig. 3: Avg. Length gain by Common Carp and Amur Common Carp



Fig. 4: Avg. Weight gain by Common Carp and Amur Common Carp

the entire study.

### REFERENCES

Basavaraju Y, Penman D J and Mair GC (2003). Stock evaluation and development of a breeding program for common carp (*Cyprinus carpio*) in Karnataka, India: progress of a research project. *NAGA, World Fish Center Quarterly* 26(2):3032.

Basavaraju Y and Reddy AN (2013). Growth performance of Amur strain of common carp in southern Karnataka. *Mysore J Agril Sci* 47(1):119-123.

Edward P and Demaine H(1997). *Rural Aquaculture: Overview*

and Framework for country reviews. In:Regional office for Asia and the Pacific (RAP), 36

FAO(2001). Promotion of sustainable commercial aquaculture in sub-Saharan Africa. In:FAO fisheries technical paper 408/1, Rome, Italy.

Hari O V and Sagar C M (2018). Evaluation of growth performance of amur common carp (*Cyprinus carpio*) and mrigal (*Cirrhinus mrigala*) with major carps in polyculture system. *J Ento and Zoology Stu* 6(2):2277-2281.

Jhingran V G(1982). *Fish and fisheries of India*. Hindustan Publishing Corporation, New Delhi.

Received on 25/06/2020

Accepted on

20/08/2020