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Comparative study of a protein during breeding and non breeding season of *Clarias garipinus*

Kurhe Archana, Shivaji Chavan*, Sumayya Ansari
Department of Zoology, Fisheries Research Laboratory, School of Life Sciences, Swami Ramanand Theerth Marathwada University, Nanded, Maharashtra, India

Abstract
Protein is very important source for growth and development of organisms. Proteins need to repair cells and make new ones. Protein play an important role in growth when it is consumed in childhood, teenage, and pregnancy. During this life stages body required large amount of protein for proper growth. As fish meal contain very large amount of protein. Fish protein is easily digestible and very low fat content. Protein value fluctuates according to species, sex, age, temperature, habitat and season in fishes. All these factors affects on protein quantity. Fresh water catfish *Claras gariepinus* used as an experimental fish protein was estimated from various tissues or organs of *Clarias gariepinus*. Protein was estimated from pancreas, gills, kidney, testis, ovary, muscles, and liver. The results obtained is the amount of protein during non-breeding season is higher than that of breeding season.

Keywords: breeding, non breeding season, protein estimation, *Clarias gariepinus*

Introduction
Fish is an aquatic animal respire with the help of gills and swims with the help of fins. Fishes constitute a well-defined highly successful group of vertebrates. They inhabits a variety of different kinds of environment ranging from deep water of ocean to the boundless. Surface of the open sea and from high tropics to the receding polar region. They live in fast running torrential streams, the muddy waters of bays, brackish estuaries, stagnant pools and in the waters several feet under the ground in the caves. Fish is good nutritious food for human. The flesh of fish is rich in proteins and fat. Dry fish contain vit. A and vit. D and minerals. Oil from the liver of many fishes is extracted. Cod liver oil contains vit. A and D. Fishes are made in to the fine powder this is called fish meal it is used by weak and convalescent people in their diet. Fish waste material have more calcium, protein, phosphorus and other substances. The material used as fertilizer to grape gardens, banana, coffee and tea plant. Some of the fishes like *Gambucia barbs* will eat the larval forms of mosquitoes, thus, they prevent the mosquito borne diseases. Many investigators studied comparative study of the biochemical and hematological parameters of fish species [1, 2, 3, 4, 5, 6].

It is well established that in all vertebrates the pituitary gonadotropin and gonadal steroid are the hormones most directly involved in the regulation behavior. Pituitary hormones may stimulate the secretion of gonad hormone which in turn regulate reproductive behavior of fish. Breeding habits started at the beginning of early rains in the month of February and continued until June, after which the proportion the breeding female decline gradually while the proportion of breeding male decline sharply. The amount of protein measured during breeding and non-breeding season of *Clarias gariepinus*. In this study *C. garipinus* is a fresh water catfish. It is hardy fish that able to live in very vast climatic conditions even it can survive in mud. *C. gariepinus* is carnivorous fish feeds on zooplanktons, larvae, aquatic insects, fishes, aquatic birds, mollusks etc. Generally fishes breeds in rainy season but *Clarias garipinus* breeds in winter season. Aim of this research was to determine the reference value of protein. *Clarias gariepinus* is African sharp tooth catfish is a species of catfishes of the family *Clariidae.* These are air breathing catfishes. It was investigated to determine changes in protein content during breeding and nonbreeding season of this species.

Materials and Method
For this study *Clarius gariepinus* was used as an experimental fish. The stock of *Clarius gariepinus* were collected from weekly Wednesday fish market of Taroda Naka region in Nanded city maharashtra (India), in the year 2016-18.

Collection and Maintenance of Fish
The present research was undertaken in the PG Department of Zoology Science College, Nanded. The healthy specimans of *Clarius gariepinus* were collected from weekly Wednesday fish market of Taroda Naka region in Nanded city (Sumayya and Chavan 2021) [7], Maharashtra (India). Live fishes were carried from the fish market

to Science College, in empty polythene bags. Distance of travelling was 20 minutes. After 20 minutes fishes were kept in water tank which is made up of plastic. About 10 fishes are collected firstly. This study was done during the year 2016 to 2018.

Collection of Sample

After collection of sample specimen of *Clarius gariepinus*, the specimen were sacrificed by tracking on their head. After death, the morphometric measurements (length / weight) was taken and mechanically dried in hot ovan at controlled temperature.

Separation of Organs

Fish was dissect out on ventral region and organs like kidneys, testies (Males) ovaries (Female) were separated from the body. And gills were collected. Whereas muscles were separated from dorsal middle peripheral region of body by using sterile blade and forceps. After separating all organs weight the fishes accurately by using electric weighing balance. The study was done in two seasons first in non – breeding season then in breeding season. About six specimens were selected five females.

Biochemical Estimations

During non -breeding season about five fishes were cought with/ weight in between 250-300 gm and length group of / 20 - 25 Cm from the fishes about following amount of tissues were obtained.

Table 1: Type of tissue and wt. collected from the sample specimen.

Sr. no.	Tissues	Weight of tissues(mg)	Subsamply (gm)
1	Pancreas	48.9	1.0
2	Testies	1.419	1.0
3	Ovary	6.72	1.0
4	Kidney	2.97	1.0
5	Muscles	21.96	1.0
6	Gills	9.85	1.0
7	Liver	6.70	1.0

Biuret method: for the estimation of protein Biuret method is used.

Result

The present investigation deals with estimation of protein during breeding and non-breeding season of *Clarias gariepinus*. The result showed that good quality of protein is present in *Clarias garipanus* during non-breeding season. The result interpreted that proximate composition of protein in fish depends on season. Amount of protein in different tissue during breeding season shown in Table-1. The proximate amount of protein in seven different tissues the pancreas, ovary, kidney, muscles, gills, livers, testis are as in table. The amount of protein measured to be highest in kidney i.e. 0.065 during breeding season. Similarly protein content is also moderate in gills i.e. 0.061. In ovary, muscles, pancreas no significant difference were found. Amount of protein in different tissues during non-breeding season shown in table-2. The highest amount of protein found in ovary i.e. 17.1 mg/g wt. of tissues and lowest amount of protein found in pancreas i.e. 3.4 mg/g. no significant difference found in protein values of kidney (11.1), muscles (13.3), gills (14.9), livers (10), testis (12.3) in non-breeding season (monsoon). Amount of protein in different tissues during non-breeding and breeding season is shown in table-3. The amount of protein in highest in ovary (17.1) during non-breeding season (monsoon). While the amount of protein lowest in during breeding season i.e. 0.05 which is found in pancreas. The least amount of protein found in breeding season in all tissues. The higher amount of protein is found during non-breeding season (Monsoon) in all tissues. Lowest protein found in pancreas i.e. 3.4 (mgs) during non-breeding season. While the 0.065 is amount of protein in kidney is highest during breeding season. In non-breeding season no significant differences found in protein values of kidney (11.1), muscles (13.3), gills (14.9), Liver (10), and testis (12.3) and in breeding season no significant differences in protein values were found in ovary (0.058), muscles (0.045), gills (0.061), livers (0.048) and testis (0.038) The difference between amount of protein during breeding and non-breeding season shown in (table 4). The protein content of ovary was highest i.e. 17.1 was highest value. The seasonal variation in average mean of proximate composition of protein of *Clarias gariepinus* (table. 5). The value of protein is highest i.e. 11.28(mgs). The protein is highest during non-breeding season. The amount of protein (0.052143) is less during breeding season.

Table 2: pxoximate amount of Protein during breeding Season in *C.gariepinus*

Sr. No.	Name of Tissue	Amount of Protein (mg/g)
1	Pancreas	0.05
2	Ovary	0.058
3	Kidney	0.065
4	Muscles	0.045

5	Gills	0.061
6	Livers	0.048
7	Testies	0.038

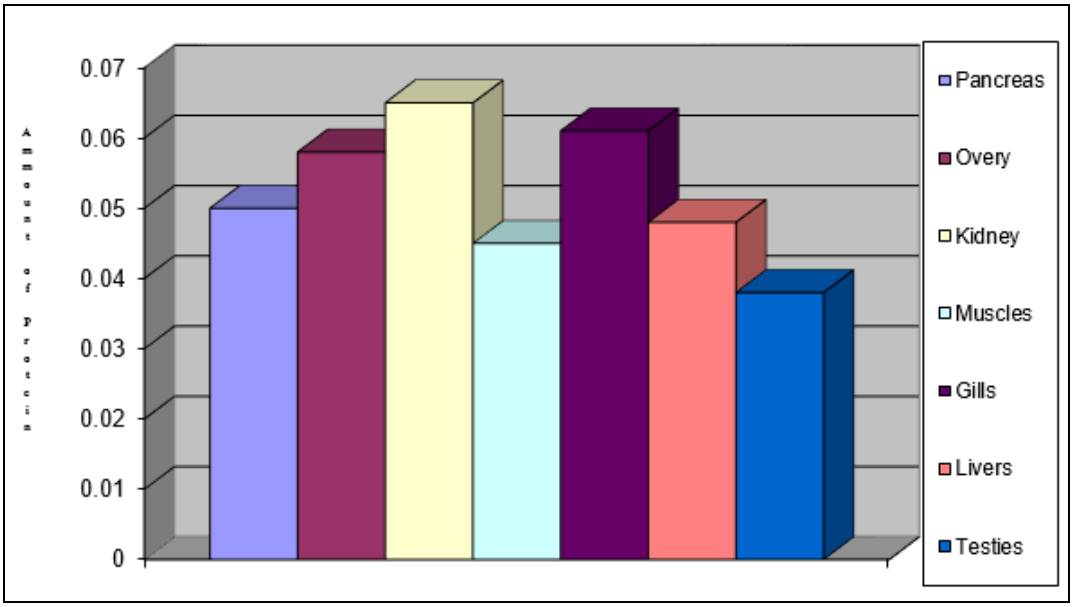

Fig 1: Amount of protein durind breeding season

Table 3: Amount of Protein during non-breeding season in C. gariepinus

Sr. No.	Name of Tissue	Amount of Protein (mg)
1	Pancreas	3.4
2	Ovary	17.1
3	Kidney	11.1
4	Muscles	13.3
5	Gills	14.9
6	Livers	10
7	Testies	12.3

Table 4: Amount of protein during non-breeding & breeding season in *C.gariepinus*

Sr. No.	Name of Tissue	Protein during non-breeding	Protein during breeding
1	Pancreas	3.4	0.05
2	Ovary	17.1	0.058
3	Kidney	11.1	0.065
4	Muscles	13.3	0.045
5	Gills	14.9	0.061
6	Livers	10	0.048
7	Testies	12.3	0.038

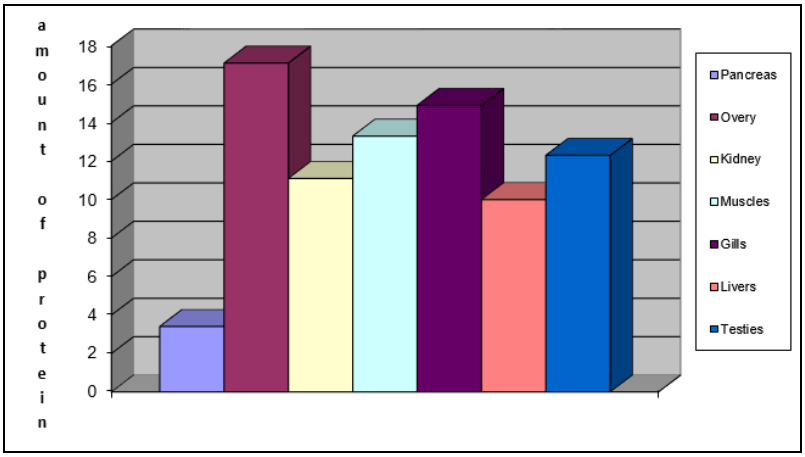

Fig 2: amount of protein during non-breeding season

Table 5: Seasonal variation in average mean of proximate composition of protein of Clarias gariepinus.

Sr. No.	Biochemical Parameters	Non-Breeding Season	Breeding Season
1	Protein	11.72857	0.052143

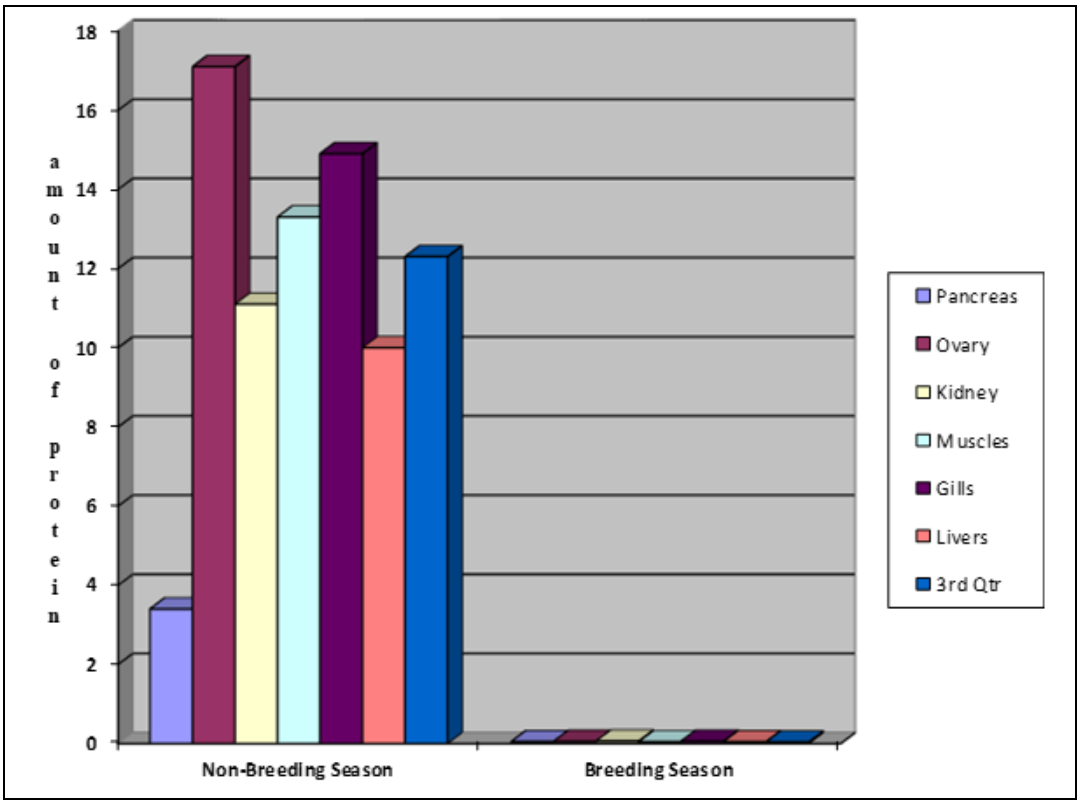

Fig 3: Amount of protein during non-breeding and breeding season

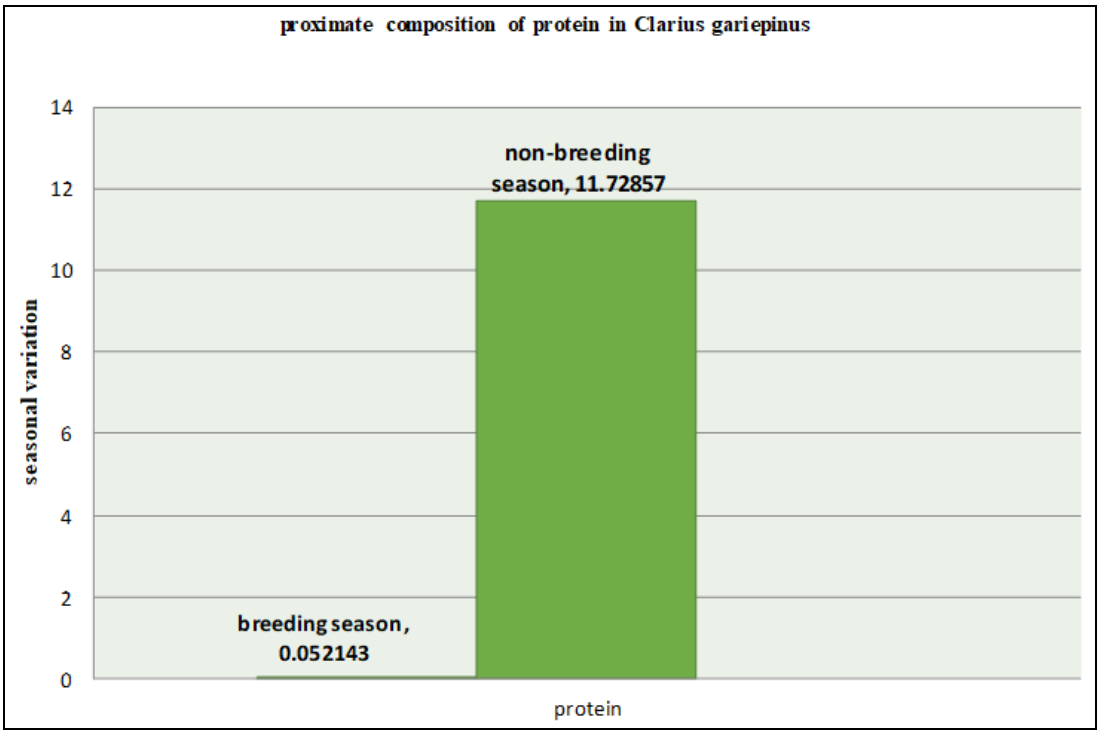

Fig 4: seasonal variation in average mean of proximate composition of protein in *Clarias griepinus*.

Conclusions

The *Clarias gariepinus* is a fresh water african catfish now banned in India. Comparative study of protein concentrate was conducted from various organs in *Clarias griepinus* during breeding and non-breeding seasons. The amount of protein was calculated from pancreas, ovary, testies, gills, muscles, livers, kidneys. The

proximate composition of protein during breeding season (0.05) is lower than that of proximate composition of protein during non-breeding season. The breeding season of is *Clarias gariepinus* from September to March. Proximate composition of proteins was (11.72) it was highest during non-breeding season and amount of protein (0.05) is lower during breeding season. Protein during non-breeding season is high about 234.4% to that of non-breeding season.

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References

1. Mohan A, Senthikumar D. Assessment of Hematological and serum biochemical parameters of three commercially important fresh water fishes in river Cauvery Velur, Namakkal District Tamil Nadu, India, International Journal of fisheries and Aquatic Studies,2016:4(1):155-159.
2. Fazio F, Marafioti FA, Piccione G, Faggio C. Comparative study of the biochemical and Hematological parameters of four wild Tyrrhenian fish species. Veterinary Medicina,2013:58(11):576-581.
3. Francesco F, Concetta S, Giuseppe P, Osman SK, Umit A. Comparative study of some Hematological and Biochemical parameters of Italian and Turkish farmed Rainbow trout Oncorhynchus mykiss (Walbaum, 1792). Turkish Journal of Fisheries and acquatic sciences, 2016. DOI 10.4194/1303 2712-V16-3-25.
4. Salbego JC, Toni AG, Becker CC, Zeppenfeld CC, Menezes VL, Loro BM *et al*. Biochemical Parameters of silver cat fish (Rhamida quelen) after transport with eugenal or essential oil of Lippia alba added to the water, 2016. http://dr.doi.org/10.1590/1519-6984.16515.
5. Paria A. Consideration of blood serum biochemical parameters of yellow fin sea Bream (Acantopagrus Latus Houttuyn, 1782) and orange – spotted Grouper (Epinephelus coides Hamilton, 1822) Advances in biolgical chemistry,2014:4 407-413.
6. Sanatan S, Dixit PK, Patra AK. Biochemical Analysis of lipids and proteins in three fresh water teleots (Clarias batruchas, Channa punctatus, Anabas testudineus) Research Journal of Recent Sciences,2016:5(6):24-33.
7. Sumayya A, shivji C. scaly teleosts in local fish markets of nanded citymaharashtra. International jornal of fisheries and aquatic research,2021:6-2:76-81.