

## **A Comparative Biochemical Study On Iron Content In Various Forms Of *Clarias* Species**

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### **Abstract**

The present study was carried out to investigate the iron content in three forms of *Clarias* species viz; *Clarias batrachus* and *Clarias gariepinus* and their intermediate forms in water bodies of Meerut region. Asian catfish (*Clarias batrachus*) was found rich in iron content as compared to its African counterpart *Clarias gariepinus* and the intermediate form. *Clarias batrachus* contained 66.66mg iron/100g body weight showing vast difference with *Clarias gariepinus* ranging from 1.40mg/100g to 1.60mg/100g; the iron content of intermediate form was in between the two existing species viz; *Clarias batrachus* and *Clarias gariepinus* ranging from 21.30mg/100g to 22.20mg/100g.

### **Introduction**

Aquaculture has become recognized as a growth area of economic importance in many countries and has attracted the attention of both the private and public sectors. The development plans of most fish producing countries are aimed at increasing fish supplies from aquaculture for local and export markets, and at increasing the sector's contribution to food security in rural areas.

From the consumer point of view, the fish magur (*Clarias batrachus*) is a very popular fish in the Indian subcontinent owing to its flesh quality with high protein and iron contents, less fat and easy digestibility, characteristic aroma and softness, less intramuscular spines and capability of longer out of water survival ensuring freshness and due to these factors it always command high price and demand in market. Now *Clarias batrachus* is facing a serious challenge for existence from its African counterpart *Clarias gariepinus* in the country. During the course of our study, Intermediate form of *Clarias* species were also observed along with *Clarias batrachus* and *Clarias gariepinus*. Total iron content was observed in all the three forms of *Clarias* species viz., *Clarias batrachus*, *Clarias gariepinus* and their intermediate form.

### Material and Methods

Fishes for the present investigation were collected from different water bodies in and around Meerut region . Fishes collected were acclimatized in the laboratory on pelleted food for eight to ten days. Meristically and morphometrically Indian catfish-*Clarias batrachus* was identified using Day's fauna (1878); While the identification of African catfish -*Clarias gariepinus* was done with the help of Teugels (1986);Intermediate form was identified with the help of Khan et al, (2002).

Fishes were divided into 3 groups *Clarias batrachus*, *Clarias gariepinus* and Intermediate form and for each group, iron estimation was carried out.

White skeletal muscles from the antero-dorsal region of all the three fish body were dissected out to free it of lateral line red muscles.Muscles were heated in a china dish over the burner to volatilize as much as organic matter then placed the dishes into a muffle furnace at 450°C for 7-8 hrs.Samples were removed from the furnace, cooled over water bath for 30 minutes then cooled and heated again for another 30 minutes by adding 9-10 ml HCL and filtered into 100 ml volumetric flask by using whatmann no 41 filter paper. The residue left on filter paper was dissolved in DDW and the volume made to 100 ml by adding more DDW .

Sample prepared from dry ash for color development into three separate stoppered measuring cylinders, pipetted the solutions as given below.

	Blank(ml)	Standard (ml)	Sample (ml)
Standard iron solution (1 ml=0.1 mg of Fe)	0.0	1.0	0.0
Sample ash solution	0.0	0.0	5.0
Water	5.0	4.0	0.0
Conc.	0.5	0.5	0.5
Potassium persulphate	1.0	1.0	1.0
Potassium thiocyanate	2.0	2.0	2.0

In each of the above cases, volume was made to 15 ml with distilled water. Color was measured at 480 nm setting the blank at 100% transmission.The iron was estimated using this formula

$$\text{Iron } mg/100g = \frac{OD \text{ of Sample} \times 0.1 \times \text{Total volume of ash solution} \times 100}{OD \text{ of Standard} \times 5 \times \text{Weight of Sample taken for ashing}}$$

### Results

Total Iron content of *Clarias batrachus*,*Clarias gariepinus* and intermediate form were observed by One Way Analysis of Variance (ANOVA) followed by Post Hoc Tests of Multiple comparisons (Tukey HSD).The levels of significance are expressed as P value equal to or less than 0.05. The results are depicted in table No 1.

TABLE NO. 1. Descriptives of Total Iron Content

Species Name	N	Mean	Std Deviation	Std Error	95% Confidence Interval		Min.	Max.
					Lower Bound	Upper Bound		
<i>C. batrachus</i>	30	66.6600	1.572	2.870	66.6600	66.6600	66.66	66.66
<i>C. gariepinus</i>	30	1.4900	8.449	1.543	1.4585	1.5215	1.40	1.60
Intermediate form	30	21.6900	.4536	8.282	21.5206	21.8594	21.30	22.20

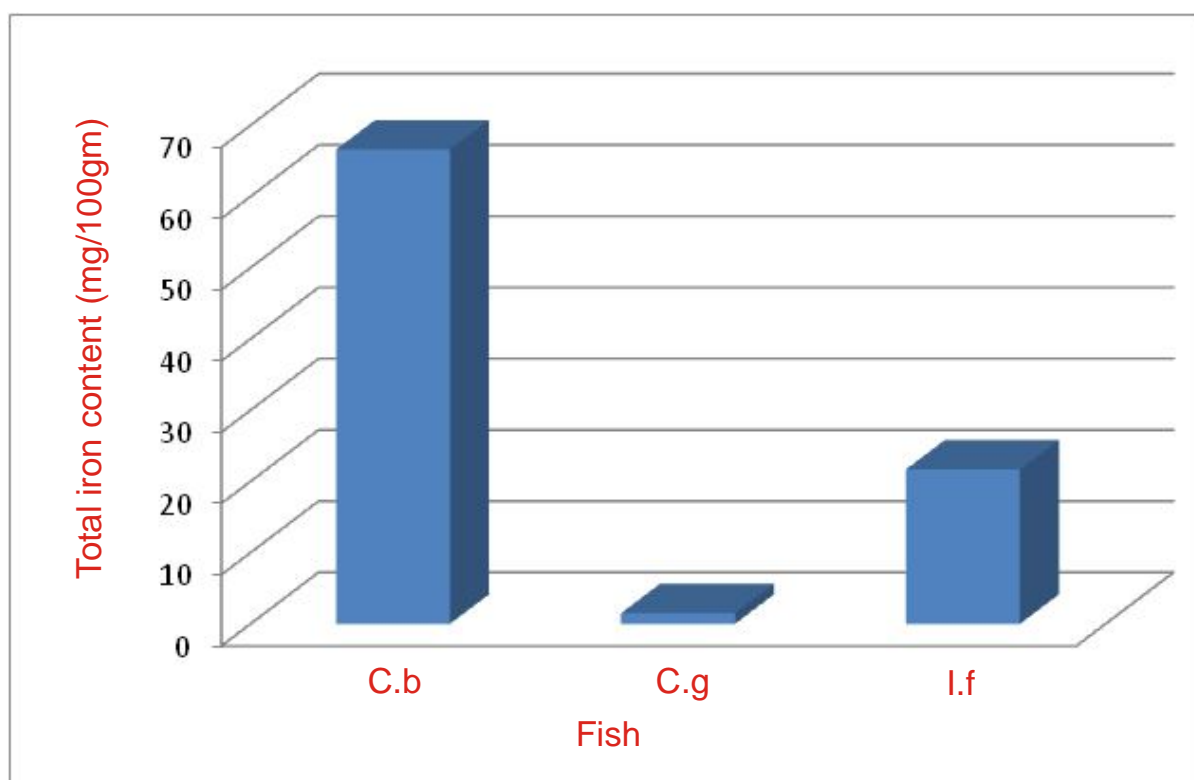


Fig.4 (A) : Histogram showing Total iron content of different forms, viz. *Clarias batrachus*, *Clarias gariepinus* and Intermediate form.

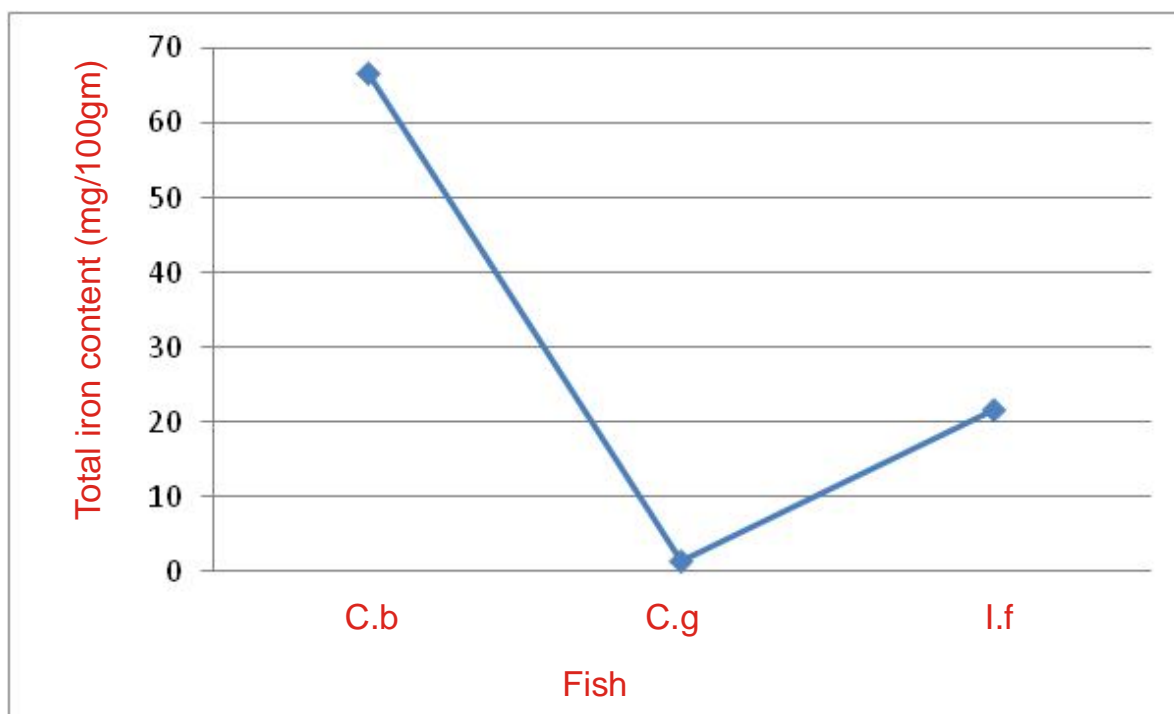


Fig.4 (B) : Histogram showing Total iron content of different forms, viz. *Clarias batrachus*, *Clarias gariepinus* and Intermediate form.

### Summary

The present study was undertaken keeping in view that no such work has been done on *Clarias batrachus* Fawole et al, (2007) studied proximate and mineral composition in some selected fresh water fishes in Nigeria and reported 0.12% Iron content in *Clarias gariepinus*. Aremu and Ekunode (2008) presented nutritional evaluation and functional properties of *Clarias lazera* (*Clarias gariepinus*) and reported 2.5 mg/100 g iron in *Clarias lazera*. Present study showed 66.66 mg/100g iron content in *Clarias batrachus* while 1.40 mg/100g to 1.60 mg/100g iron in *Clarias gariepinus* indicating clearly that *Clarias batrachus* is a rich source of iron. Intermediate form was also analysed for total iron content estimation which contain 21.30 mg/100g to 22.20 mg/100g iron content which is in between the two species studied.

Higher iron content level could be the reason for *Clarias batrachus* to be tastier and healthier as compared to the other two forms, *Clarias gariepinus* and intermediate form so we need to save and conserve our native magur, *Clarias batrachus* which is facing serious challenge for existence because of unauthorised introduction of *Clarias gariepinus* in 1993 in India and till then increasing number of *Clarias gariepinus* and intermediate form day by day.

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