Morphometric Characters and Their Relationship of Freshwater Catfish Fish *Clariusbatrachus*(Linnaeus, 1758)from Aurangabad Region (M.S) India

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Abstract: *Present studydeals with the morphometric relationship of Clariusbatrachus. The morphometric measurements (Total length, Standard length, dorsal length, pectoral length,pelvic length analanal length) were recorded. The regression and correlation coefficient (r) were analyzed with independent variable (total length) and dependent variable (other morphometric parameters). A linear relationship was found between total length and morphometric characters. The result shows that morphometric parameters are highly correlated to total length except anal length to total length.*

Keywords: *Clariusbatrachus,* growth, morphometric characters , meristiccharecters, total length

1. Introduction

Identification of species is a primary step towards any research work and plays a key role forthe behavioral study. Morphometric measurements and meristic counts are considered aseasiest and authentic methods for the identification of specimen which is termed asmorphological systematic (Nayman, 1965) .The variations in the morphometric characters are generally attributed to the genetic variability in the stocks or this may be because of the influence of the various environmentally controlled parameters. The analysis of the morphometric data also gives an indication about whether the fish is growing in right proportions or not. The analysis of morphometric and meristic characters is a very useful tool for characterizing the strains of the same species, which involves subtle changes in the variation of the shape and size (Jaiswal.,et al 2004).

The morphometric relationship study helps to identify a particular species and also to ascertain whether there is any homogeneity of characters or differences between their males and females. In fish, morphometric characters represent one of the major keys for determining their systematic, growth variability, ontogenetic trajectories and various population parameters Kova c, V., G.H. Copp, and M.P. Francis. (1999).

Hence, the present study was carried out to investigate the relationship between various morphological characters of *Clariusbatrachus* and to establish mathematical equations relating to the various morphometric relationships which could be utilized for the conversion of one measurement into another.

2. Materials and method

Samples were collected and brought to fishery research laboratory. The specimens were measured for total length (TL), in cm. Metric characters were measured with digital slide calliper on the fish body (total length, standard length,dorsal length, pectoral length, pelvic length ,anal length). Morphometric relationships between parameters (Total length -standard length,total length- dorsal length, total length-pectoral length, total length- pelvic length, total length – anal length) were calculated using the linear regression equation. For the calculation of regression equations Excel 2008 was used.

3. Results

The correlation and regression analysis was carried out for some important characters in relation to total length - standard length, total length- dorsal length, total length-pectoral length, total length- pelvic length, total length – anal length. In the present study the higher values of correlation coefficient (r) of standard length, dorsal length, pectoral length ,pelvic length showed high degree of correlation in relation to total length while the value of anal length (0.80) indicated low degree of correlation (Graph 1.5) .
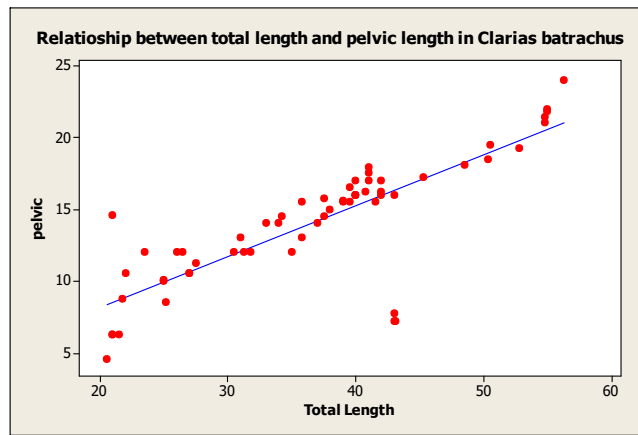
Total length and standard length was calculated as r = 0.99. Standard length = 0.184 + 0.865 Total Length (Graph 1.1). Total length and dorsal length was calculated as r = 0.94 . Dorsal = 1.23 + 0.253 Total Length(Graph 1.2) . Whereas the total length and pectoral length was calculated as r = 0.91(Graph 1.3). pectoral = 1.54 + 0.148 Total Length. Total length and pelvic length is calculated as r = 0.81.pelvic = 1.13 + 0.353 Total Length (Graph 1.4). Total length and anal length is calculated as r = 0.80.anal = 2.39 + 0.399 Total Length which is showing low degree of correlation (Graph 1.5). Significant correlation exist between total length - standard length, total length- dorsal length, total length-pectoral length, total length- pelvic length, total length – anal length.

Results shows that there is a biological relationship among different morphometric characters which is highly significant and indicate the proportional positive increase in morphometric parameters with total length.
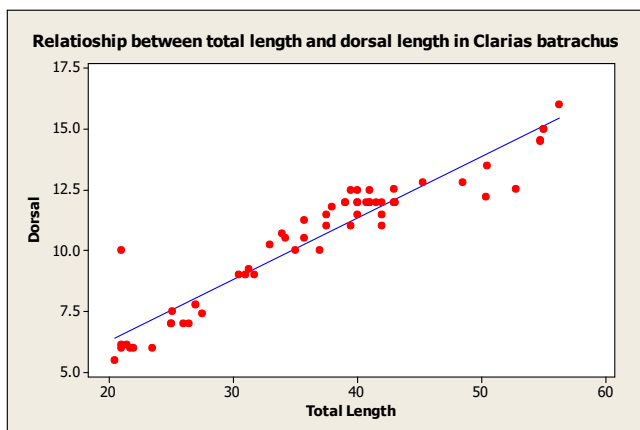
Paper ID: ART20177364
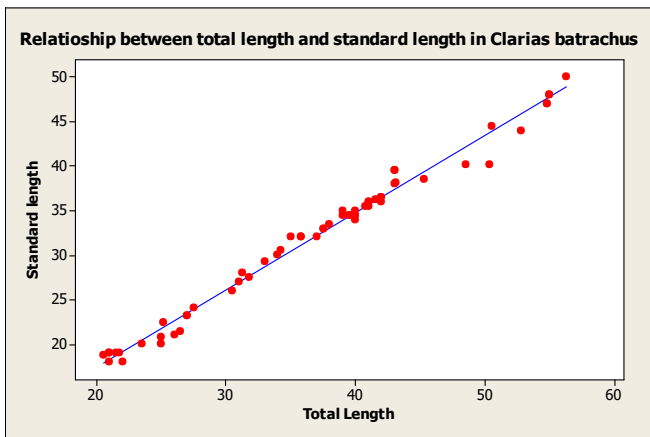
Graph: 1.1 Relationship between total length and standard length.

Regression Analysis: Standard length with Total Length
The regression equation is
Standard length = 0.184 + 0.865 Total Length

Graph 1.2: Relationship between total length and dorsal length

Regression Analysis: Dorsal versus Total Length
The regression equation is
Dorsal = 1.23 + 0.253 Total Length

Graph 1.3: Relationship between total length and pectoral length

Regression Analysis: pectoral with Total Length
The regression equation is
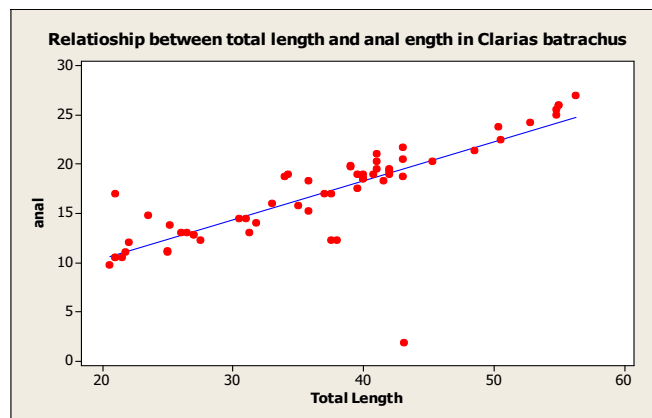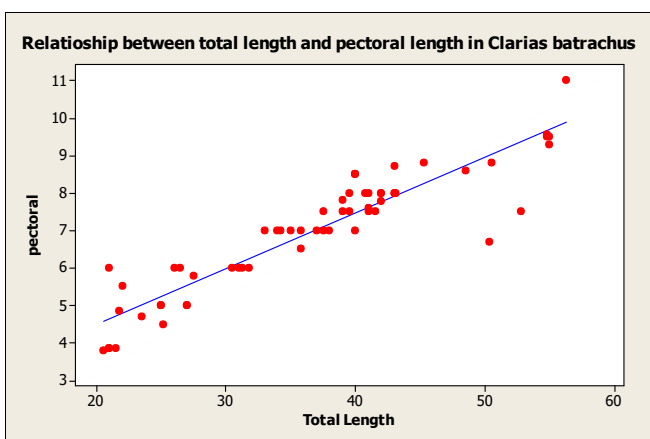pectoral = 1.54 + 0.148 Total Length

Graph 1.4: Relationship between total length and pelvic length.

Regression Analysis: pelvic with Total Length
The regression equation is
pelvic = 1.13 + 0.353 Total Length

Graph 1.5: Relationship between total length and anal length.

Regression Analysis: anal with Total Length
The regression equation is
anal = 2.39 + 0.399 Total Length

4. Discussion

Morphometric characters of fish are an important tool in fishery biology and taxonomic studies and it is one of the vital factors for the proper management of a species M.H. Ferdaushy and M.M. Alam,(2015). The significance of the statistical relationship of morphometric characters has also been recognized in all taxonomic and systematic studies to solve various problems concerned with the life history of fish (T.B. Bagenal and F.W. Tesch, 1978). The morphometric relationships between various body parts of fish can be used to assess the well beingof individuals and to determine possible difference between separate unit stocks of the same species(King, 2007).According to Kolher et al., (1995) these relationships are considered necessary to estimate various morphological and physiological aspects such as growth rates, length and age structures, and other mechanisms of fish population dynamics.

In the present study it was observed that the higher values of r showed that the variables are highly correlated. The total

length of *Clariusgariepinus* is positively correlated to standard length . Similar results were obtained by M.Begum.,et al (2008) in the estuarine catfish *M. gulio*.When SauliheenQadri .,et al (2017) studied measurements of various morphometric characters of S. curvifrons ,found standard length showed maximum degree of correlation (0.94%) with total length Similar observations have been also quoted by M.R.Amin .,et al (2014) in catfish *Rita rita*. He also found a significant curvilinear relationship exist between total length and morphometric charecters. Muhammad Naeem.,et al (2012) reported Standard length (SL), dorsal fin length (DFL), pectoral fin length (PcFL), pelvic fin length (PvFL) and anal fin length (AFL) of *Labeocalbasu* are found to be highly correlated with increasing total length and wet body weight. MuhammadNasir .,et al (2017) studied Length-weight and morphometric relationship of farmed male and female *Clariasbatrachus* from Pakistan and observed the significant correlation among the morphometrics.

5. Conclusion

The present study aims to investigate the morphometric relationship of freshwater catfish *Clariusbatrachus*. The higher r values showed that the variables are highly correlatedthat indicate the proportional positive increase in morphometric parameters with total length.This type of study is one of the vital factors for the proper management of a species andcan be used to assess the well being of individuals and to determine possible difference between separate unit stocks of the same species However, further and more detailedresearch are necessary for future assessment.

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