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The Study of fecundity and its relation to the fish length, fish weight and ovary weight of Hemipimelodus Jatius

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Abstract
In The fecundity of Hemipimelodus Jatius, Total length, Total Weight (in per 500 grams), ovary weight (per hundred milligram) the number of eggs give a direct liner relationship, giving a "Straight line" has been observed.

Keywords: fecundity, hemipimelodus jatius, straightline

1. Introduction

The fecundity of Hemipimelodus Jatius reproductive capacity of the fishes has been considered in relation to the total length. Gonad weight and its ova production. This can be determined by the number of eggs shed in each spawing season (Pillay, 1954). The number of eggs produced, may differ in different species with difference in size and the age and the dependence of fecundity upon these factor, would mean variation from year to year in the total fecundity of the population. This, in the widest sense, will mean the difference in the favorability of the environment for the reception of eggs which will result in the change of the brood each year of the young stock (Kesteven, 1950). Relationship between the fecundity; total length; total weight; and ovary weight of the fishes have been established by the following formula:

$$Y-Y=b(X-X) \text{ or } y=a+bx$$

Where Y is the fecundity of the fish, Y th mean of the Y;Y= total length, total weight and ovary weight of the fish in the respective analysis; x=mean of the x; and b-regression coefficient (in the calculation, the logarithmic relationship has been established).

Materials and Methods

Complete study has been for the fishes under the three different heading

1. Fish size, gonad weight and average ova production.
2. Fecundity in relation to the fish, size (length), fish weight and ovary weight.
3. Sex ratio

1. Fish size gonad weight and average ova production:-

Investigations relate separately the length and weight relationship ovary weight and its percentage; and estimate with their count per gram body weight and per hundred milligram ovary weight.

Hemipimelodus Jatius direct proportional ratio of the eggs and fish size is evident in the fish. The number of ova are 252718 for 74.6 cms, and 57218 in 39.7cm. have been obtained the variation in the egg is high but the average fecundity volume confirms the above ratio. The increase in the range varies from 57972 to 219982 in 35.5 to 77.5 m.m. of total length average production in each 500 group of fish indicates a clear upward trend in the number of ova as it is 46262 in 750 gms. And 241950 in 2550 gms. This indicates the heavier weight more egg. Ration has been established in gonad and body weight, the ranges being 7.69 to 11.59 percent mean (9.6%) of the ovaries of that of the total weight of body. The number of per gram weight of the mature ovary has been computed with an average of 599.34 (calculated) with this a direct relationship (64262 to 252718 kin 70.0 to 610.0 gm) is obtained.'

2. **Fecundity and its relation to the fish size, fish weight and ovary weight.**

The evident from data that the fecundity of a fish shows remarkable variations. This is probably because of the difference in the weight or the condition controlling the maturity. More over the ova in the similar stage and weight shows a difference because of the production cycle in each individual. The random method gives a rought estimate of the potential stock and the variation in number may be due to the size and their hetero genous distribution.

Fecundity and total length relationship work of franz (1910) is distinguished, in which he has described the increase in fecundity remains proportional to the square of the length, simpson (1951) found some basic errors in it and showed the cube of the length to be better than the former. He further samrised that this was probably due to the simple the oretical argument as the eggs production being a surface phenomenon. Hemipimelodus Jatius fish the parabolic relationship has been obtained. The correlation coefficient r = 0.9419 showing the hight degree of correlation as log Y=1.0266 + 2.8819 log X. here the test of linearity is found to be significant.

Fecundity and ovary weight relationship has been a point of interest to different workers as hickling (1940) [6] stated a direct correlation ship between the weight of the ovary and the number of the eggs. The same has also been shown by prabhu (1955) and Bhatnagar (1964). A straight line relationship of hemipimelodus jatius has been obtained with a high degree of positive correlation ship r = 0.9329 as long Y = 0.6382 + 2.1760 log X. The test of linearity is also highly significant.

3. **Sex Ratio**

The sex ratio, control the bearings of the fishable stock. This mainly deals with the ratio and its deviation in different sexes all-round the year. This probably gives a hint in the stocking as well as in the productivity. Hemipimelodus Jatius During the study, over thirteen hundred of the specimens have been collected and 1:1.25 ratio is obtained for male and females respectively the female have higher ratio than the male. The percentage of male is high in the month of August and October while the females in July. September and Novermber. In January the ratio reached 1:4 while in February

and August the percentage of both sex is equal. In march, July, October and November the percentage of male is slightly higher than the female. While from April to June on in September high percentage of the female. Mostly the seize distribution of both the sexes denotes that there are more male than females among the smaller But among bigger ones. The female are more abundant. See the table 1-A, B2- A, B, 3-A, B.

Table 1: Regression analysis of the fecundity in respect of the total length of the fish Hemipimelodus Jatius (Ham.) Regression Data

Degree of freedom	Sum of squares of log total length	Sum of the products of the log total length and log fecundity	Sum of squares of the log fecundity	Regression Coefficient	Correlation coefficient
(f)	(sx^2)	(Sxy)	(sy^2)	(b)	(r)
48	151.5301	436.6903	1336.0491	2.8819	0.9419

Table 2: Test of linearity of the regression by analysis of the variance.

Source of variation	Degree of freedom	Sum of squares	Mean square variance	Observed (F)	5% (F)
Variation due to	1	1258.4977 77.5514			
Regression-Residual-	47	1336.0491	1258.4977 1.6500	762.7258	4.05
Total	48				

Table 2: Regression analysis of the fecundity in respect of the total weight of the fish Hemipimelodus Jatius (Ham.) Regression Data

Degree of freedom	Sum of squares of log total weight	Sum of the products of the log total weight and log fecundity	Sum of squares of the log fecundity	Regression coefficient	Correlation coefficient
(f)	(sx^2)	(sxy)	(sy^2)	(b)	(r)
48	541.2228	824.1134	1336.0491	1.5227	0.9392

Table 3: Test of linearity of the regression by analysis of the variance.

Source of variation	Degree of freedom	Sum of squares	Mean square variance	Observed (F)	5% (F)
Variation due to	1	1258.4977	1254.8774	726.5806	4.05
Regression- Residual-	47	81.1717	1.7271		
Total	48	1336.0491			

Table 4: Regression analysis of the fecundity in respect of the ovary weight of the fish Hemipimelodus Jatius (Ham.) Regression Data

Degree of freedom	Sum of squares of log total length	Sum of the products of the log total length and log fecundity	Sum of squares of the log fecundity	Regression coefficient	Correlation coefficient
(f)	(sx^2)	(Sxy)	(sy^2)	(b)	(r)
48	263.2493	572.8216	1336.491	2.176	0.9329

Table 5: Test of linearity of the regression by analysis of the variance.

Source of variation	Degree of freedom	Sum of squares	Mean square variance	Observed (F)	5% (F)
Variation due to	1	1246.4598			
Regression-Residual-	47	89.5893	1246.4598	653.9130	4.05
Total	48	1336.0491	1.9061		

Result

Fecundity and total length, the number of eggs gives a direct proportionality to the fish size as they show a general "Parabola" relationship.

Fecundity and weight (In per 500 grams) proportionality give a clear upward trend showing a "Straight line" relationship.

Fecundity and ovary weight (Per hundred milligram) a liner relationship, giving a "straight liner" has been observed. The behavior has been dealt under in this study has been done under maturation. Spawning, reproductive behavior and gonado-somatic index. The have been studied in different fishes separately.

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