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OBSERVATIONS ON SOME ASPECTS OF BIOLOGY OF *PENTAPRION LONGIMANUS* (CANTOR)

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ABSTRACT

During the period 1984 -'88, catches and catch per hour values of *Pentaprion longimanus* fluctuated from year to year and month to month but the annual average catches together with catch rates showed increasing trend. The spawning period of *P. longimanus* is short extending from December to March. Average fecundity was found to be 3,023 eggs and fecundity increased with weight of ovary and to a less extent with the length of fish.

Among the lesser known species of fishes caught by private trawlers off Visakhapatnam, *Pentaprion longimanus* occupies a place since it has it's demand both in fresh and dried condition particularly by the poorer folk. As miscellaneous group this species contributes to 1 - 2% of total catches. As no work has been done on the biology of this species along the Andhra coast, an attempt has been made during the period 1984 - '88 to study the fishery and on some aspects of biology of this species with reference to spawning habits, fecundity, length - weight relationship and sex ratio.

Fresh specimens were collected once or twice in a week from the catches of private trawlers from the fishing harbour jetty and brought to the laboratory for analyses. The total length in millimeters and weight in grams of each specimen were mesured and recorded. Maturation stages were determined by macroscopic and microscopic examination of fresh ovaries while diameters of ova were taken from 5% formaline preserved ovaries to trace the development of ova to make study by following the procedure of Clark (1934). The total number of mature eggs were estimated by counting the mature eggs in a piece of overy and raising it to the total weight of the overy.

Effort and catch per effort of *P. longimanus* during 1984 -'88 is given in Table 1.

In 1984, the catch per hour values during different months varied with minimum of 0.04 kg/hr in August and a maximum of 0.54 kg/hr in July. During 1985 -'88, the monthly catches as well as catch rates fluctuated from month to month and also from year to year with varying minimum and maximum values but the average annual cph values increased from 0.18 kg/hr in 1984 to 0.40 kg/hr in 1987. More or less similar increasing trend was seen in the average annual catches also.

Size distribution of ova in maturing and mature ovaries from fishes whose total length ranged from 112 - 135 mm is shown in Fig 1. In Fig 1A there are two modes 'a' and 'b' formed by the maturing ova at 25-26 and 19-20 micrometer divisions. Further these

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TABLE 1. *Catch, effort and catch per effort of* Pentaprion longimanus *during the period 1984 - 1988*

Months	1984			1985			1986			1987			1988		
	Catch (kg)	Effort (hr)	C/E (kg)	Catch (kg)	Effort (hr)	C/E (kg)	Catch (kg)	Effort (hr)	C/E (kg)	Catch (kg)	Effort (hr)	C/E (kg)	Catch (kg)	Effort (hr)	C/E (kg)
Jan.	10,630	37,846	0.28	9,747	21,114	0.46	7,725	19,457	0.39	7,023	43,979	0.15	6,410	32,100	0.19
Feb.	5,888	23,990	0.24	5,984	20,859	0.28	10,654	27,878	0.38	5,141	29,459	0.17	4,619	33,137	0.13
Mar.	2,371	29,697	0.07	2,997	8,708	0.34	13,409	38,323	0.34	23,734	27,874	0.85	3,812	14,807	0.25
Apr.	6,729	35,730	0.18	10,716	15,429	0.69	10,124	6,512	1.55	9,228	13,128	0.70	14,680	16,950	0.86
May	4,280	22,830	0.18	1,008	5,950	0.16	11,904	8,490	1.40	22,645	11,332	1.99	4,131	16,389	0.25
Jun.	464	26,474	0.12	—	22,086	—	8,897	18,213	0.48	5,223	10,641	0.49	1,218	29,598	004
Jul.	15,327	28,329	0.54	2,486	19,208	0.13	20,246	20,124	1.00	4,639	36,214	0.12	13,793	23,976	0.57
Aug.	1,058	24,587	0.04	—	39,033	—	598	28,812	0.02	12,158	34,332	0.35	6,053	45,880	0.13
Sep.	5,101	46,457	0.11	13,872	17,612	0.78	660	32,172	0.02	18,818	26,342	0.71	4,186	28,383	0.15
Oct.	5,621	40,379	0.14	6,416	47,374	0.13	418	24,611	0.02	4,709	22,119	0.21	1,133	23,666	0.04
Nov.	6,273	47,241	0.13	1,338	9,522	0.14	3,447	37,812	0.09	302	19,312	0.02	523	15,635	0.03
Dec.	5,727	26,676	0.21	7,260	33,650	0.21	3,226	37,179	0.08	958	14,365	0.06	7,375	29,863	0.24
Total	69,469	390,236	0.18	61,824	260,495	0.24	91,308	299,583	0.30	114,578	289,097	0.40	67,933	310,384	0.22
Average	5,789	32,520	0.18	5,152	21,708	0.24	7,609	24,965	0.30	9,548	24,091	0.40	5,661	25,865	0.22

modes could be traced in Fig. 1B as the mode 'a' has progressed to 29-30 m. d and the mode 'b' could be traced at 25-26 m.d. In the running or ripe ovaries obtained from fishes in which the total length ranged from 119-122mm the ova has further developed forming two modes at 39-40 m.d and representing modes 'a' and 'b' respectively. The ova falling under 'b' will also increase in size and will be liberated as they turn transparent and fully ripe in due course.

Monthly percentage frequency distribution of adult females in different stages of maturation in *P. longimanus* is given in Table 2. From the table it is seen that during the period September - November high percentage of maturing females while from December to March, mature and ripe females occurred in the catches. Further during the period March - May, spent fishes and juveniles measuring 40-50 mm could be encountered during the post spawning period and only immature and maturing females of stage II-III ovaries are available from June to August. Thus from the above mentioned observations it is inferred that the species breeds only once in an year and the spawning period is extended for about three to four months.

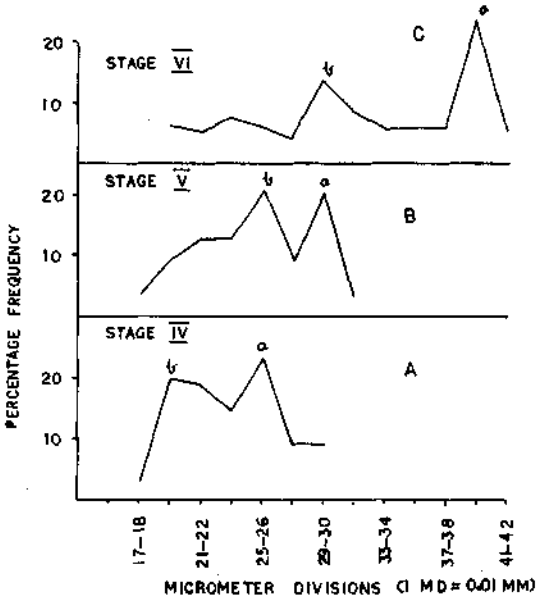

FIG. 1. Percentage frequency size distribution of ova in mature ovaries of *Pentaprion longimanus* (Cantor).

Forty eight mature specimens in which the total length varied from 93 to 135 mm were examined. In *P. longimanus* fecundity varied from 2,088 to 6,669 with an average of 3,083 eggs. It is observed that unlike other fishes such as sciaenids, nemipterids and lizard fishes in which the average fecundity is more than fifty thousand, in *P. longimanus* the average fecundity is comparatively less than one thousand. Further it is noticed that fecundity increased with increase in weight of ovary and to some extent with the weight of fish but to a little or less extent with the total length of fish (Fig. 2-4).

The relationship between the fecundity and total length was found to be :

Log F = 1.9213 + 0.0381 Log L; r = 0.036462

The relationship between fecundity and ovary weight was expressed as :

Log F = 0.3576 + 0.6076; r = 0.7472

Fecundity (F) and fish weight could be expressed as :

Log F = 1.0233 + 0.0711 Log L; r = 0.17192

The percentage composition of males and females in the population is given in Table 3. From the Table it is seen that the ratio between males and females is not constant but varied independently since in certain months i.e., in November and December, '88 and April, '89 the percentage of males was more while in September, February and March the percentage of females was more than the females.

The study of length-weight relationship is based on 210 fishes ranging in total

TABLE 2. *Monthly percentage frequency distribution of adult females in different stages of maturation of* P. longimanus

Months	Nos. Examined	Stages of Maturation						Immature
		II	III	IV	V	VI	VII	
September, '88	21	45.2	50.0	4.80	-	-	-	-
October, '88	Nil							
November, '88	17	-	28.0	48.2	23.8	-	-	-
December, '88	22	-	-	14.3	63.8	22.7	-	-
January, '89	23	-	-	10.0	58.3	31.7	-	-
February, '89	31	-	-	-	80.2	10.8	9.0	-
March, '89	21	-	-	-	20.8	19.2	60.0	-
April, '89	12	-	-	-	10.0	-	90.0	-
May, '89	80	-	-	-	-	-	-	100.0
June, '89	25	-	-	-	-	-	-	100.0
July, '89	18	-	-	-	-	-	-	100.0
August, '89	20	-	-	-	-	-	-	100.0

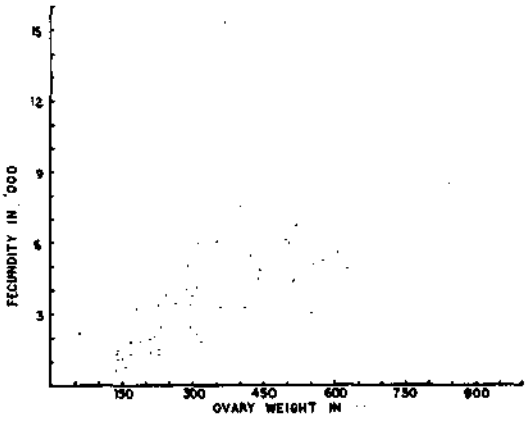

FIG. 2. Relationship between Fecundity and Ovary weight of *Pentaprion longimanus*.

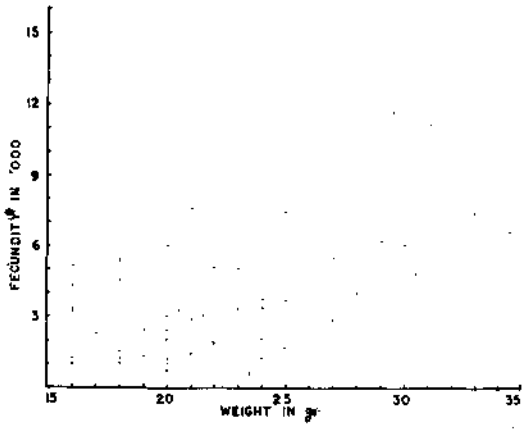

FIG. 3. Relationship between Fecundity and Fish weight of *Pentaprion longimanus*.

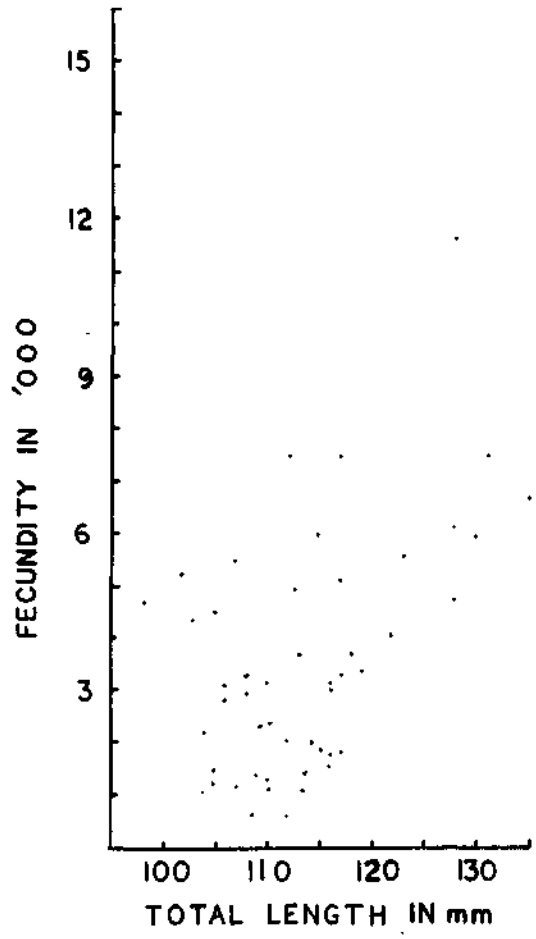

FIG. 4. Relationship between Fecundity and Length of *Pentaprion Longimanus*.

TABLE 3. *The percentage composition of males and females in different months during the period 1988-'89 in P. longimanus*

Months	Males	Females
September, '88	4.5	95.5
November, '88	58.8	41.2
December, '88	64.5	35.5
January, '89	-	100.0
February, '89	24.4	75.6
March, '89	48.8	51.2
April. '89	53.8	46.2

length from 60 - 132 mm (Fig. 4). An analysis of co-variance by the method of Snedcor (1961) was conducted to test the significance between the regression co-efficients and adjusted means for males and females separately (Table 3). It is observed that there is no significant difference at 5% level between sexes and hence a common equation was calculated for the species and is given below:

$W = 0.001455\ L^{3.31112}$ or

$\text{Log } W = -2.1631 + 3.3112$

REFERENCES

CLARK 1934. *Calif. Fish and game*, 42 : 1-49. SNEDCOR, C. W. 1961. *Statistical Methods. Applied Experiments in Agriculture and Biology* (Indian Edition) Applied Pacific Private Ltd., Bombay, 534 pp.

TABLE 4. *Comparison of regression lines of length-weight relationship of males and females of* Pentaprion longimanus.

with in	df	X^2	XY	Y^2	Reg co-efficient	Deviation df	From ss	Regression Mss
Male	98	0.0931	0.3176	0.9464	3.4111	97	-0.13705	-0.00413
Females	110	0.0740	0.2357	0.9427	3.1986	109	0.19196	0.00176
Pooled (within)						206	0.05491	0.00237
Combined	208	0.1671	0.5533	1.8891	3.3112	207	0.05702	0.000275
Between	-	-0.0022	0.0028	-0.0023		1	0.00211	0.00211
Total	209	-0.1693	-0.5561	-1.8914	3.2847	208	0.06478	
						1	0.00776	0.00776

Slope : F = 0.8903 (1,206) Not significant at 5%.
Elevation : F = 28.218 (1,207) S.