



## Studies of the Fecundity of Sind Sardine fish, *Sardinella sindensis* (Day, 1878) (Family: Clupeidae), from Karachi coast, Pakistan.

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### Abstract

*Sardinella sindensis* is one of the dominant small pelagic fish of Karachi coast of Pakistan. Investigation on fecundity of sind sardinella was studied from January 2001 to April 2002. A total of 37 ovaries were examined of stages IV-VI (when not running). Mean fecundity ranged from 47521 to 110876 eggs. Log-log relationship between fecundity with total body-length, fish-weight & ovary weight were correlated. Therefore it may be mentioned that the fecundity is generally proportional to the size of the ovary, which in turn is related to the size of the fish. The mean number of ova/g body weight and mean number of ova/g ovary weight were found to be 2425.250 and 9537.855 respectively. The gonads were two lobed; the left lobe was more fecund than the right one.

**Keywords:** *Sardinella sindensis*, Fecundity, Karachi coast.

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### 1 Introduction

*Sardinella sindensis* is a small and common Sardine species of Sind, Pakistan. The Sind sardinella lives in the pelagic-neritic coasts of Sea in the depth range of 0 - 50 m. It is distributed in Western Indian Ocean: Arabian Sea, from Gulf of Aden to the Persian Gulf and Bombay. A clear knowledge of the fecundity of fishes is an essential pre-requisite in any program of fishery research and management policies [1]. In the group of Sardines, *S. sindensis* is economically important in the coast of Karachi. *S. sindensis* is commonly called Chacko, has widely used by poor families. In present study fecundity is defined as the number of oocytes at the stages IV-VI (when not running) before spawning. Different scientists like: [2, 3, 4, 5, 6, 7, 8, 9, and 10] worked out on the fecundity of different marine fish species. Prior Information on different sardines species are also availables like: [11, 1, 12, 13,]. There is paucity of information on the study of reproductive biology of the *Sardinella sindensis* in the Karachi coast. The reproductive biology of *Sardinella sindensis* has not been widely reported in literature. The aim of this study was to investigate the fecundity which is an important aspect of the reproductive biology. It is hoped that the information obtained from this study will contribute to our knowledge of the reproductive biology of *Sardinella sindensis* and will be useful for fisheries and aquaculture production.

### 2 Materials and methods

A total of 417 fishes of *S. sindensis* were randomly sampled at fortnightly intervals from the commercial landings at korangi creek and west wharf fish harbour Karachi, during the period of Jan, 2001 – April 2002. The fish was identified by using the [14, 15] (FAO fish identification manuals). Simple random sampling technique was used [16]. All fishes were kept frozen until required length and weight of each sample were recorded. Gonads were dissected out and measured, and after that preserved in 10% formalin to hardening of ova for fecundity. The estimated total number of eggs were obtained weighting and counting 2 – 3 small sample, Three samples of ova 0.4 gm known weight, each (with ovarian tissue) were taken from the anteriorly, middle, and posterior parts for estimating fecundity, relative fecundity for number of eggs per gram of fish weight was also calculated.

Table 1: Mean Fecundity Counts at various length ranges in *S.sindensis*

Freq.	Lth. Range.	Mean Length of Fish(mm)	Mean Wt. of Fish(g)	Mean Wt. of Ovary. (g)	Mean NO. of Ova.	NO. of Ova/gm. Wt. Of Body.	NO. of Ova/W T. of Ovary.
02	17-17.4	17.2	47.9	5.2	50331	1005.339	9707.899
01	17.5-17.9	17.6	49.2	5.2	47521	9650.874	9138.653
09	18.0-18.4	18.1	51.0	5.6	51480	1010.152	8197.682
07	18.5-18.9	18.6	56.5	6.6	48795	1133.249	8351.333
09	19.0-19.4	19.1	63.6	8.4	64895	1020.97	8729.375
07	19.5-19.9	19.6	73.0	8.0	89160	1791.179	11144.869
02	20.0-20.4	20.0	81.2	9.6	110876	1364.9898	11495.179
37	17-20.4	18.6	60.342	6.8	66151.142	2425.250	9537.855

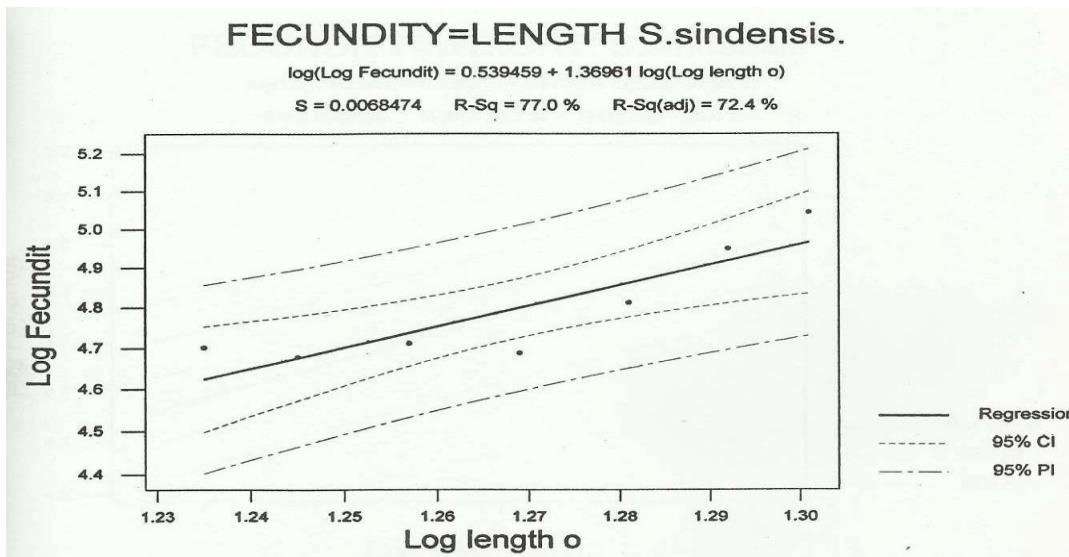


Fig. 1: log of body length

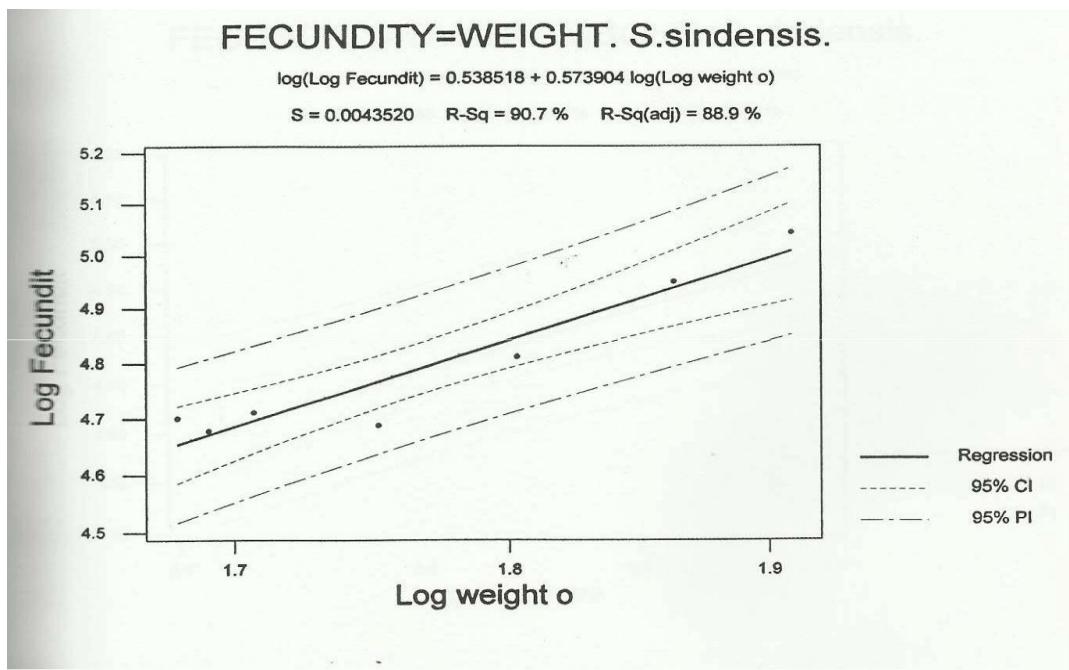


Fig. 2: log of body wt.

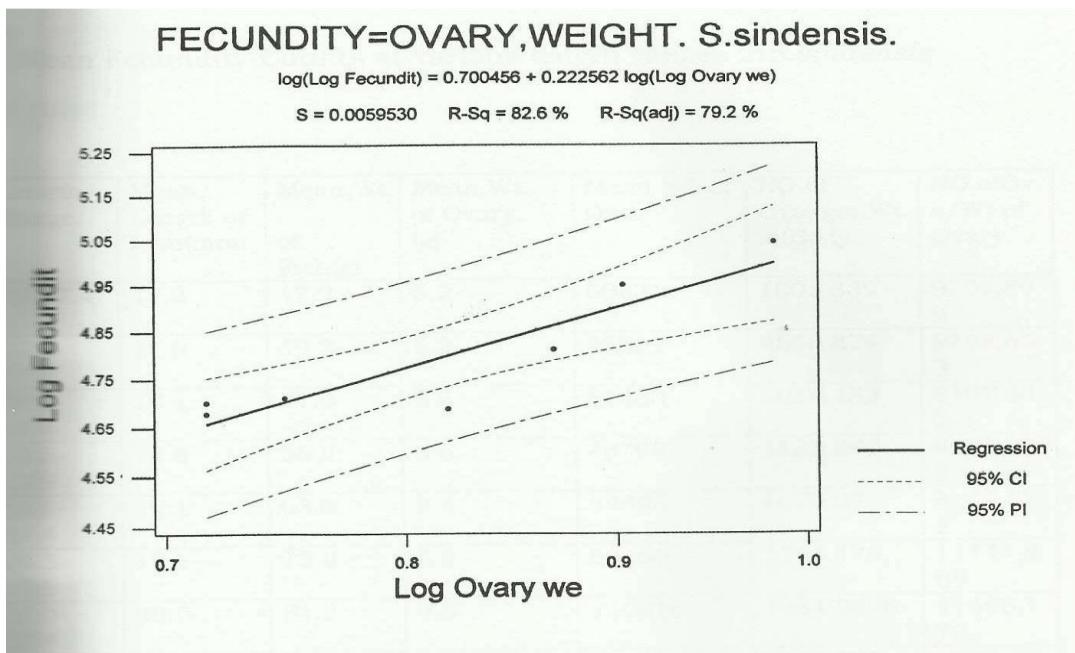


Fig. 3: log of ovary wt.

### 3 Results and discussion

The ovaries of 37 mature *Sardinella sindensis* stages (IV- V1) obtained from fish measuring 17.00 mm to 20.4 mm TL (Total length) and 47.9gm to 81.2gm weight were considered for the study of fecundity, it was estimated in relation to several variable size. T.L(total length) of fish, body weight of fish and ovary weight, and details, Mean fecundity at various length ranges are given in (Tab. 1) It is seen from the sample that the left ovary which is slightly larger than that of right. The number of ova depending on the differences in size. The fecundity of Oil Sardine, *S. longiceps* was estimated as 75,000 eggs calculate by [11].Therefore it may be mentioned here that the fecundity is generally proportional to the size (length) and weight of the fish, (Fig. 1, 2 & 3.). The mean fecundity calculated to be 66151 the minimum and maximum being, 47521and 110876 from the fish measuring 17.5 mm T.L and 20.4 mm, T.L respectively. The number of ova/gm body weight and ovary weight is determined to be 2425 and 9537 were respectively (Tab. 1; Fig. 1, 2 & 3).The gonads were two lobes the right (smaller) and the left (larger). The right lobe is less fecundity from then that of left lobe. On the basis of this details the total ova for an ovary weighing 6.8gm was estimated as 66151 of *S. sindensis* from the Karachi coast. [17, 18] Correlated the fish weight and fecundity and found straight line relationship between fish weight and fecundity. The findings of the present work are in agreement with their observations and it also reveals that the mean production per gram of fish decreased with higher weight grouping of fishes.

In *Sardinella sindensis* the fecundity is more closely related to fish length than fish weight. Similar views are expressed by [18] in *Schizothorax richardsonie* and [19] in *Lasio gonius*. This study will contribute valuable knowledge needed for fisheries management and aquaculture of *Sardinella sindensis* by increasing the knowledge of reproductive biology of *Sardinella sindensis*

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