

## A RACIAL STUDY OF SILVER POMFRET *PAMPUS ARGENTEUS* (EUPHRASEN) FROM THE ORISSA COAST

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### ABSTRACT

Observation on racial study of silver pomfret *Pampus argenteus* (Euphrasen) inhabiting the Orissa coast was undertaken for the first time. Statistical treatments of meristic and morphometric characters of stocks were made from three widely spaced sampling areas. The morphometric characters chosen were head length, predorsal distance, preanal distance, snout length, pectoral fin length and maximum depth. Dorsal fin rays, anal fin rays and gill rakers were selected for meristic counts. Results indicate that the three stocks are very similar and the fishery draws on one homogeneous population.

Pomfrets constitute an important fishery along the Orissa coast. The total landing of pomfrets during 1976 from the seas around India is estimated to be 37,701 tonnes of which Orissa alone contributed 10,699 tonnes. The pomfret fishery is mainly contributed by the silver pomfret *Pampus argenteus* (Euphrasen), the Chinese pomfret *Pampus chinensis* (Euphrasen) and the black pomfret *Parastromateus niger* (Bloch) forming minor part of the catch. According to Roy and Roy (1974) the silver pomfret forms nearly 22.99% of the total gillnet catch from Chandipur in the northern part of Orissa. In the past decade, there has been a steady rise in the fishing effort with mechanised boats throughout the country to exploit more marine fish of commercial importance. In view of the importance of population study in fishery management, an investigation was made to ascertain if silver pomfret inhabiting the coastal waters of Orissa are composed of distinct groups of populations or are homogeneous throughout their entire range of distribution.

Nintysix (96) samples were collected during 1972 to 1973 from three marine fishing centres along Orissa coast, viz. Chandipur from the northern limit of the coast; Paradeep from the central region and Gopalpur from southern limit of the range (Fig.1). All the samples were preserved in 5% formalin and detailed observations were made in the laboratory.

Seven morphometric characters 1. standard length, 2. head length, 3. predorsal distance, 4. pre anal distance, 5. snout length, 6. pectoral fin length and 7. maximum depth have been studied (Fig. 2). The regression equations were calculated by the method of least square for all six characters using the formula  $y = a + bx$  where  $x$  represents the standard length (independent variable) and  $a$  and  $b$  are two constants to be determined by least square technique. "Analysis of covariance" technique was used to test the changes in morphometric characters between the three subpopulations.

### Statistical treatment

Before the morphometric data could statistically be treated it was necessary to determine if their relationship to the fish size was linear and whether there was any significant difference between the males and females. Measurements of the above characters for 14 females and 35 males were taken at random. Scatter diagram of all these characters revealed a linear relationship between the standard length and the six characters. Regression equations were calculated by method of least squares and regression lines were drawn (scatter data omitted for clarity for each character) (Fig. 3).

The statistical analysis of six characters was found to be non-significant at 5% probability level between sexes and therefore, during further analysis of these characters these samples were treated without differentiation of sex.

From the analysis of covariance of the six morphometric characters, it is observed that five characters, *viz.* head length, predorsal distance, preanal distance, snout length, pectoral fin length and maximum depth did not show any significant difference between places.

### Meristic counts

The meristic counts used in the present study were (i) the number of dorsal fin rays, (ii) the number of pectoral fin rays and (iii) the total number of gill rakers on

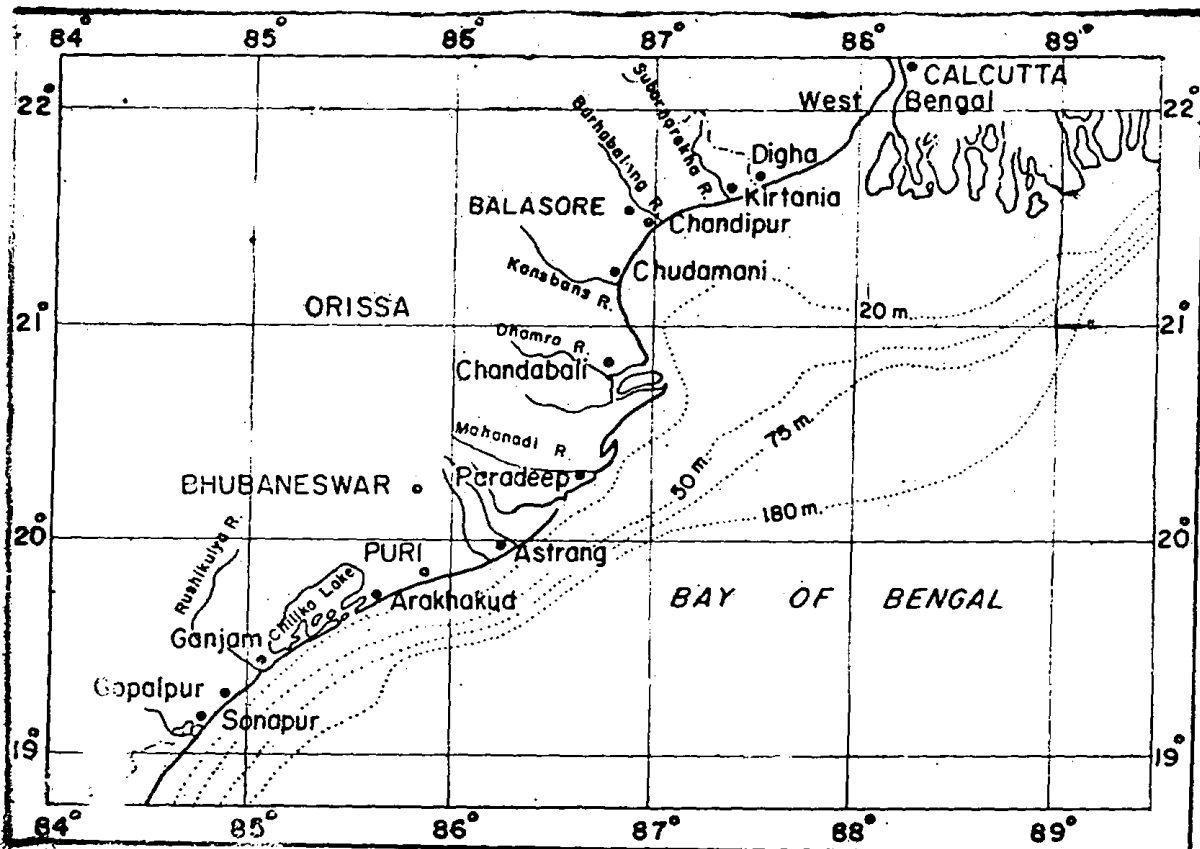


Fig. 1. Map showing Orissa coast.

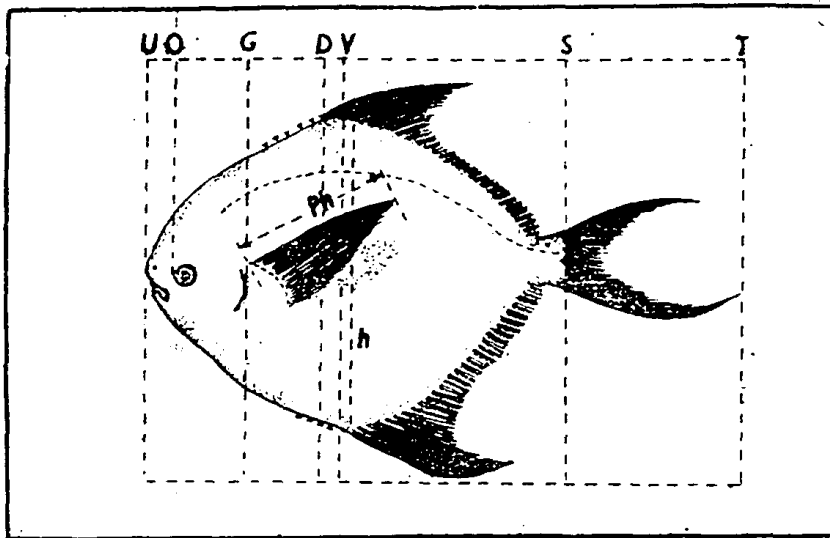


Fig. 2. *P. argenteus* showing morphometric measurements taken UT-Total length, US-Standard length, UV-Preanal distance, UD-Predorsal distance, UG-Head length, UO-Snout length, Ph-Pectoral fin length, h-Maximum depth.

the ventral arm of anterior-most arch on the left side. Examination of the number of vertebrae of specimens revealed the number to be constant ( $14+22=36$ ). It is therefore concluded that this character was not useful in the present study.

Silver pomfret is widely distributed in tropical coasts from the Iranian Gulf to Japan. Wide variation in the vertebral counts is observed in these fishes, which led Hædrich (1967) to believe that the species may be composed of many subspecies or races. Results of this investigation indicate that the stocks of silver pomfret studied from three different localities along the Orissa coast belong to the same race. The vertebral count of all the specimens examined from the coastal waters of Orissa was found to be 36. Statistical analysis of six morphometric characters and three meristic counts did not show any significant difference between the three subpopulation. On the other hand the silver pomfrets from the Arabian Sea, with a vertebral count of 37 (Kottlaus, 1977) constitute a different race.

It is therefore evident that the fishery is dependent on one homogeneous population throughout the Orissa coast. The increase in the fishing effort may not seriously damage the stock of silver pomfret, because of its short life-span, extended spawning season, fractional spawning habit and vigorous rate of multiplication (Pati, 1978). The average life span of a silver pomfret is about three years. The fish spawns twice during February to August in the offshore waters of Orissa in the coastal belt north of the River Mahanadi. The fecundity of the fish is as high as 92,000 eggs in specimens measuring 21.0 cm SL (Pati, *loc. cit.*). The wide range of spawning period extending over seven months indicates that the fish can propagate under varied environmental conditions and local hydrographic changes do not exert any serious effect on the recruitment of the year class.

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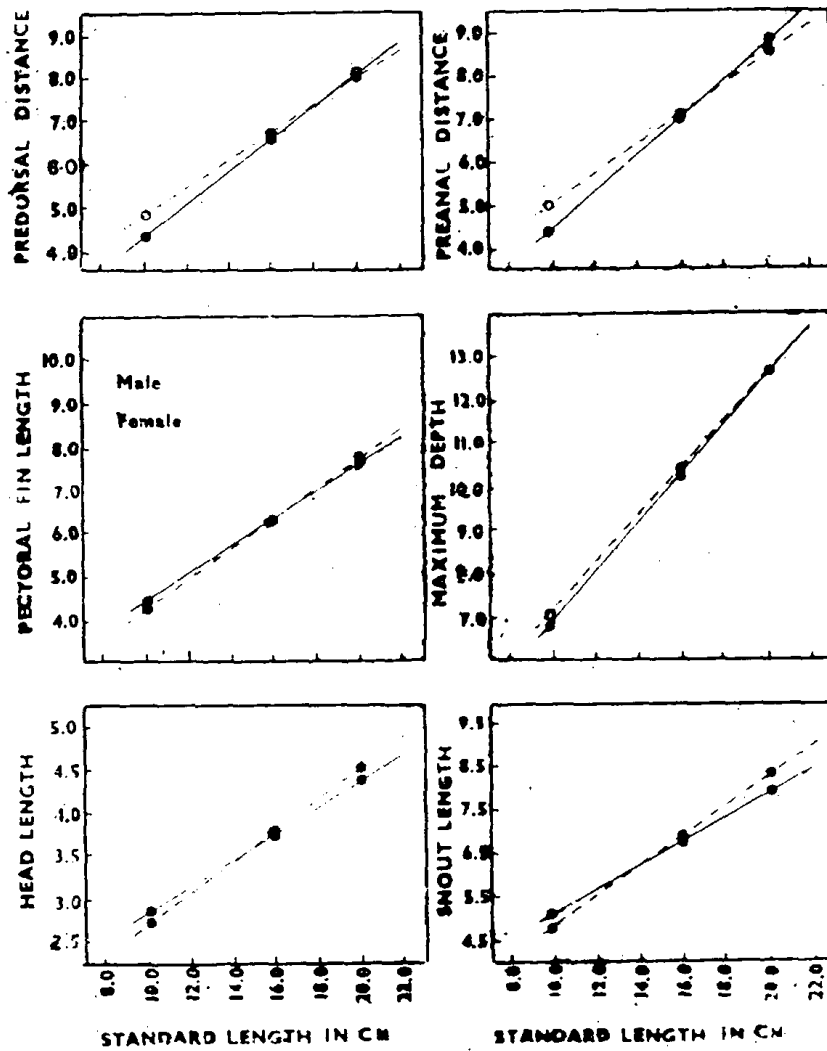


Fig. 3. Comparison of sexes of *P. argenteus* for six morphometric character.

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#### REFERENCES

- Haedrich, R.L., 1967. The stromateoid fishes: systematics and a classification. *Bulletin of the Museum of Comparative Zoology*, 135: 31-139.
- Kotthaus, A., 1977. Fische des Indischen Ozeans. A Systematischer Teil, XIX. Percomorphi (9). *Meteor Forsch-Ergebnisse*, D(25): 24-44.
- Pati, S., 1978. Studies on the biology and fishery of pomfrets (Family Stromateidae) from the Orissa Coast. Ph. D. Thesis, Utkal University.
- Roy, J.C. and S. Roy, 1974. Observations on the pelagic and semipelagic fishery of Balasore coast. *Proceedings of the Indo-Pacific Fishery Council*, 15th Session III: 41-55 (1972).