

ELECTROPHORETIC STUDIES ON SERUM PROTEINS OF OIL SARDINE (*SARDINELLA LONGICEPS*) AND MACKEREL (*RASTRELLIGER KANAGURTA*)

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Oil sardine blood tests against human typing sera indicated A - positive, A - negative and B - negative. The blood of mackerel is antigenically negative both for A and B. Electrophoretic studies on serum proteins revealed the existence of genetically different groups of oil sardine and mackerel on the south-west coast of India.

INTRODUCTION

The importance of the serological and biochemical studies for delineating subpopulations of commercially important fishes has been excellently reviewed by Ligny (1969). Though oil sardine and mackerel constitute major pelagic fisheries, particularly on the south-west coast of India, there is no information whether these are composed of genetically different stocks. A knowledge of this is a pre-requisite for proper utilization and management of these resources. In view of this, the serum protein electrophoretic investigations of preliminary nature on the oil sardine (*Sardinella longiceps* Val.) and mackerel (*Rastrelliger kanagurta*, Cuvier)

were conducted at Mangalore during October-December, 1973 and the results thereof are reported here.

MATERIALS AND METHOD

Live oil sardine (23 nos.) ranging in total length 139-210 mm. were procured from *rampani* (shore-seine) between Bolur and Surathkal, about 15 km. north of Mangalore. The fishes were immediately severed near the peduncle and were bled directly into sterilised vials containing an anti-coagulant (3.8% sodium citrate). The samples were brought to the laboratory in an ice-box and were tested against typing human sera. For electrophoresis, application of 3 μ l. of fish serum was

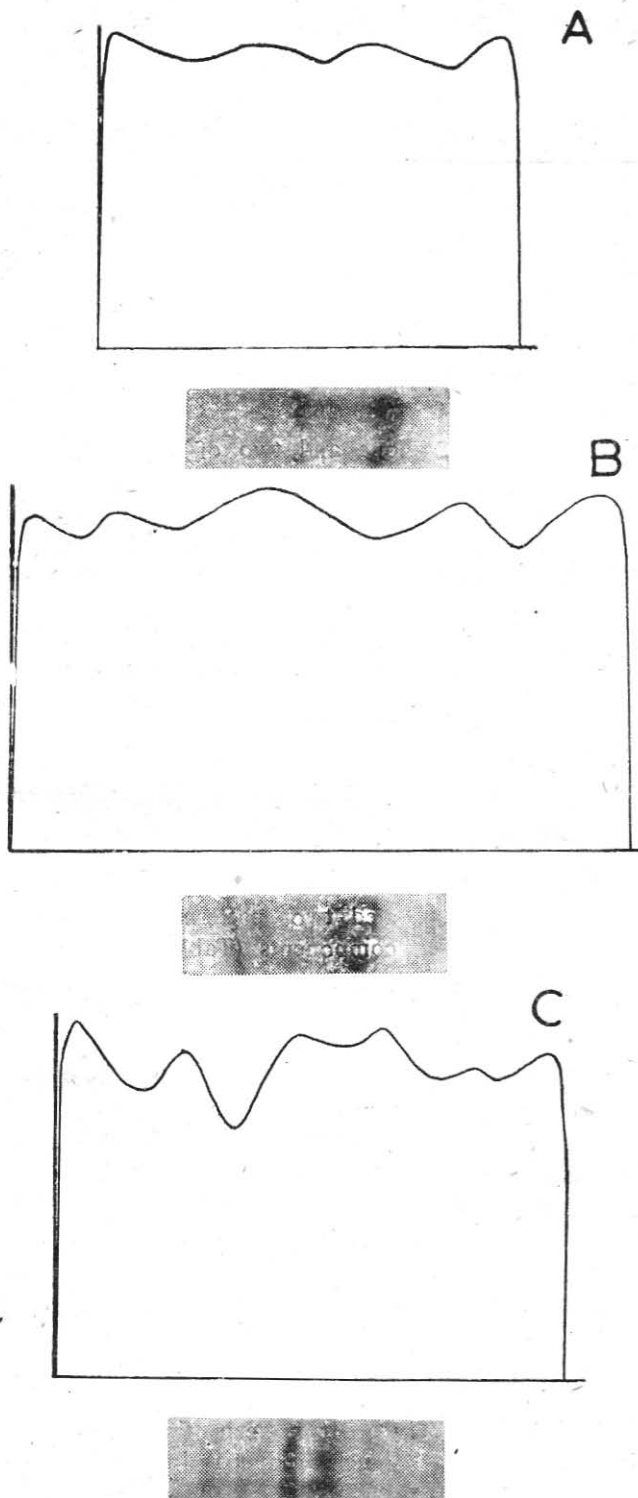


Fig. 1
Graphic representation
of the electrophoretic
separation of serum
proteins of oil sardine.
A. Four components;
B. Five components;
C. Six components.

TABLE I
Percentage values of serum protein components of oil sardine.

Groups	Components					
	1	2	3	4	5	6
A	23.6	28.9	29.8	17.8	—	—
B	16.2	13.3	32.15	19.2	18.7	—
C	16.8	20.3	20.6	15.1	13.2	14.1

made on the cellogel strips (Reeve Angel of U.K.) and 200 volts was run in a buffer (sodium barbitone solution of 8.6pH) for an hour and a quarter. The strips were stained by Amido Schwartz (Wootton, 1964), transparentised and read on the densitometer.

RESULTS AND DISCUSSION

OIL SARDINE: The tests against typing human sera revealed that 83.3% of oil sardine were A - negative and 16.7% A - positive. However, no agglutination was observed with human anti B sera in any of the cases.

Electrophoretic studies of oil sardine sera revealed mobilities leading to separation of various components. Thus, three groups designated as A, B and C with four, five and six components respectively were noticed. The characteristic patterns of these components are given along with the corresponding electrophoretograms (Fig. 1). The densitometric readings of each pattern were evaluated as per cent of the total components and are given in Table I.

It would be inferred that those with four components differ grossly from those which have more. Thus, the components

one and two of group A are appreciably higher than the corresponding values of the other groups. The percentage of component three of group A and B markedly differ from that of group C. From the pattern of components it would appear that three different groups of oil sardine constitute the catch.

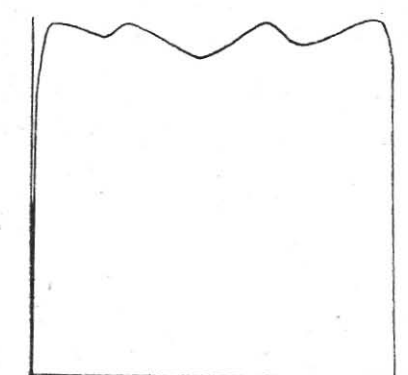
MACKEREL: Blood test revealed that all samples were antigenically negative for both A and B like *Scomber japonicus* (Suyehiro, 1949).

Electrophoresis of mackerel sera revealed two patterns with four and five components (Table II). The typical patterns are shown in Fig. 2.

TABLE II
Percentage values of serum protein components of mackerel.

Group	Components				
	1	2	3	4	5
A	20.8	30.4	29.9	18.9	—
B	12.8	30.8	17.9	15.4	23.1

It is seen that component one is much reduced in the five component



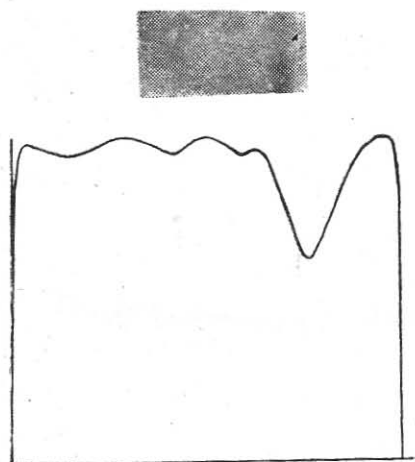
A

group. However, no significant variation is discernible among the components two and four.

The present investigations appear to show the presence of different groups of oil sardine and mackerel on the south-west coast of India, which may be genetically different.

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B

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Fig. 2. Graphic representation of electrophoretic separation of serum proteins of mackerel; A. four components; B. five components.