

## REFERENCES

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### ON AN UNUSUAL FISHERY FOR THE MACKEREL IN THE COCHIN BACKWATERS

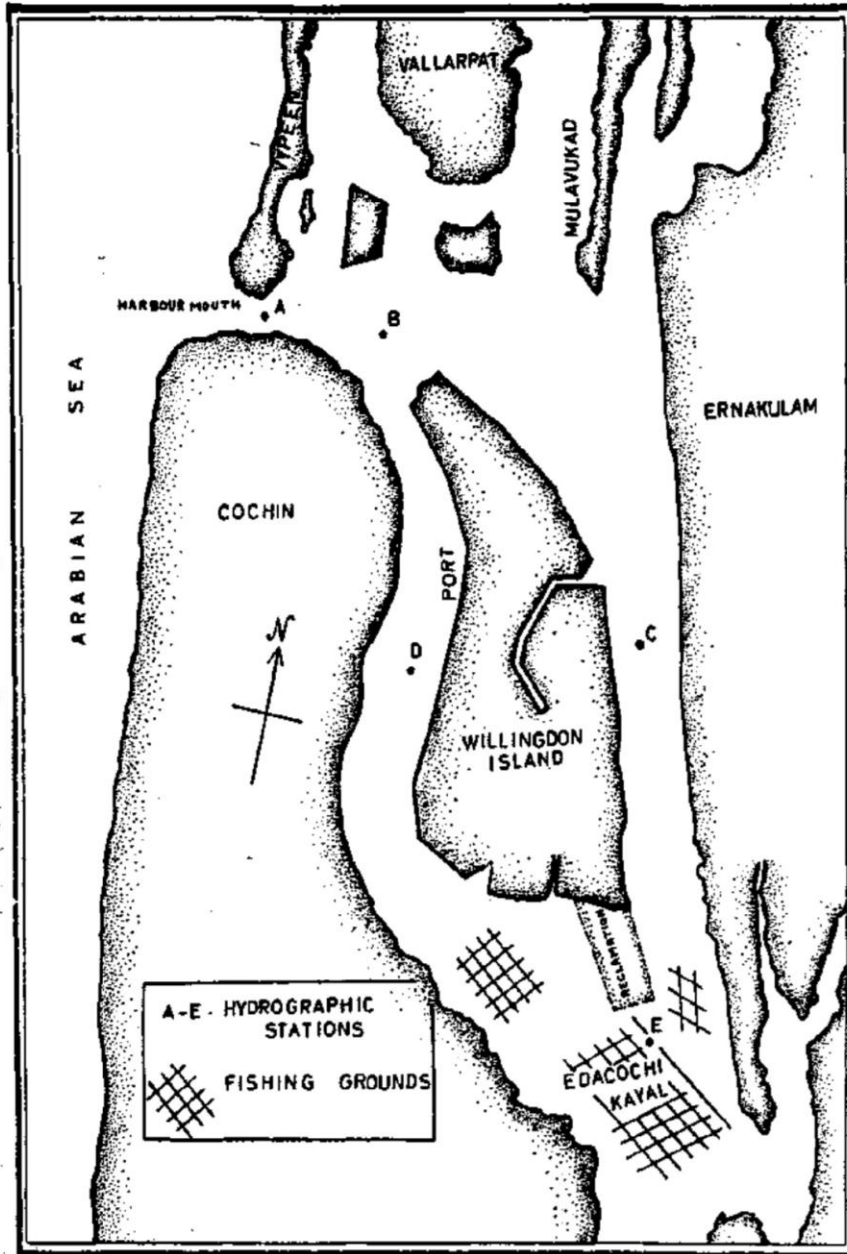
On the west coast of India, the mackerel *Rastrelliger kanagurta* (Cuvier) is reported to enter the lower reaches of the Kali river at Karwar in April and May, when the salinity of the river water is between 29.73 and 34.60‰ (Pradhan, 1956). In the Netravati at Mangalore a fishery of small magnitude, extending as far as 6 miles up the river, was observed during the January-March period in 1958 (George *et al.* 1959).

The availability of mackerel in the backwaters at Cochin was noticed for the first time during January 1961. The fish occurred in regular schools till the middle of February and an organised backwater mackerel fishery sprung up during the period. Local fishermen could not recollect any time in the past when they were rewarded with such an opportunity.

The fish was restricted to backwaters south of the Cochin harbour, while the occurrence of oil-sardine was reported from north and south. The limit of this mackerel fishery has been observed to be Edacochi, about 6 miles to the south of the harbour mouth. The main fishing ground was in the Edacochi *kayal* about 4 miles south and beyond the southern end of the Willingdon island, the depth in the area being about 4 metres. The *Pattukanni vala* (a common boat-seine of the backwaters, of mesh size 14-20 mm. measured knot to knot diagonally when stretched in the wet condition) normally used for the capture of mullets, was effectively operated for the mackerel. As the fishery proved lucrative the coastal fishermen were tempted to try gill-nets but without success, as the nets usually got fouled.

The range of size (total length) in the samples from the backwaters was 200-230 mm. The modal size for all the samples including those from the sea was 210 mm. Thus in the present case the fish from the sea as well as the backwaters were of the same size group; the mackerel samples of Netravati river and of the coastal waters at Mangalore (George *et al.*, *loc. cit.*) on the other hand belonged to different size groups. The feeding activity of the backwater fish appeared to be comparatively dull while the fish from the sea showed fairly active feeding. Among the food items, copepods and diatoms were common in all samples, but dinophyids, though in very moderate numbers, were restricted to the fish from the sea. Ovarise, bloodshot and hollow in most of the specimens, appeared to be in spent condition but showed no trace of residual eggs. Testes, some of them large and milky white, showed advanced maturity conditions. The state of maturity of the gonads was

similar in all samples. Sex composition also showed similarity, percentages of females being slightly higher.



Map of Cochin backwaters showing mackerel fishing grounds and the hydrographic stations A to E.

NOTES

Data available for the period under reference\* (January-February 1961) on range of surface/bottom (average depth, 5 metres) temperature and salinity from 5 stations (A-E, Fig. 1) in the backwaters and one coastal station, 5 miles west of Cochin (bottom in this case refers to 10 metre depth) are given in Table 1 below.

TABLE I

Minimum and maximum of temperature and salinity during January-February 1961, at 5 stations in the Ernakulam backwaters and one coastal station off Cochin.

Stations	Coastal station	A Harbour mouth	B	C (—channels—)	D	E Main fishing ground
Surface temperature range °c. ..	27.65-28.12	26.40-29.60	27.40-29.20	27.50-30.01	26.10-29.60	27.50-29.50
Bottom temperature range °c. ..	27.55-28.24	27.69-29.79	27.75-28.89	27.70-29.10	27.61-29.01	28.02-29.28
Surface salinity % ..	32.90-33.74	29.84-33.25	29.05-32.44	26.89-30.29	29.16-31.82	27.90-30.13
Bottom salinity % ..	33.22-34.18	31.74-33.70	32.15-33.22	27.99-32.52	30.12-32.57	27.65-32.45

Dissolved oxygen values at surface for station A ranged from 3.30 to 3.95 ml/L in January 1961 and a single observation during this period at the coastal station showed this value to be 4.35 ml/L.

Any particular ecological or biological factor responsible for the ingress of mackerel observed for the first time into the backwaters at Cochin is not quite clear now. However, lesser salinity and slightly higher temperature values were noticed in the backwater fishing ground compared to the coastal station. (An upward trend in salinity was noticeable at this coastal station from 1959-61 during the corresponding months). It may also be interesting to mention here the salient features noticed in the fishery conditions along this part of the coast during the period. The mackerel fishery during this season at Cochin has been the best of the last 3-4 years. A quite unusual inshore fishery of small magnitude (during November and December 1960) for *Euthynnus affinis* and a good hand and trolling line for *Cybium* spp. in September 1960 occurred along this part of the coast. The oil-sardine fishery also was a great success during the season and shoals entered the backwaters as happened during the 1957-58 bumper season.

The present observations have shown that the samples of mackerel from the sea and the backwater showed similarity with regard to their size-pattern and maturity conditions. As the feeding activity of the backwater samples was dull it cannot be suggested that the fish entered a better grazing ground in the backwaters for intense feeding. The ability of the Indian mackerel to withstand lower salinities down to 2.04‰ is known (Pradhan, *loc. cit.*); still at this centre mackerel have

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never before been reported in the backwaters, which during a good part of the year remain more saline than this limit. Probably the general abundance of the pelagic fish population including the mackerel, in the coastal waters during the present season might be the factor which influenced the mackerel shoals to enter the backwaters from the main population of the sea.

*Central Marine Fisheries Research Substation,  
Ernakulam-6.*

K. C. GEORGE

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