

ON AN UNUSUALLY DENSE
PHYTOPLANKTON 'BLOOM' AROUND
MINICOY ISLAND (ARABIAN SEA),
AND ITS EFFECT ON THE LOCAL
TUNA FISHERIES

THE fishing season in this area for the tunas [chiefly *Katsuwonus pelamis* (L.)] by surface 'chumming' and angling during the months of February, March and April 1965, was fairly good. However, early in May 1965 the tuna catches suddenly fell off to nil. An investigation revealed that the seas around this island, which lies approximately 350 miles West off Trivandrum (Kerala State, India), were darkly discoloured a deep brownish hue to a distance of at least 35 miles around it (it was not thought advisable to venture further out in the tiny boat at my disposal) and the water itself had a distinct iodoform odour; a fine gritty film was found floating on the surface of the water, in vast sheets. The Secchi disc vanished at a depth of only 4 meters, indicating the density of the brownish suspended matter. Plankton samples were taken daily for the next few weeks till the water finally cleared up, and these samples revealed the presence of a diatomous alga *Trichodesmium erythraeum* Ehrenb., in great quantity.

Vast amounts of the odoriferous algal matter was also washed ashore along the fringing reef and the island proper during the period of study. The 'bloom' lasted till late June 1965. The boats caught nothing during all this time. The 'bloom' suddenly disappeared from the area in late June and the vessels immediately started getting good catches.

It was apparent that the tunas avoided the area due to the presence of *Trichodesmium*, returning only after the alga had disappeared; but whether this avoidance is due to mechanical, biochemical or other factors it is difficult to say, and remains yet to be studied.

A similar phenomenon in European waters was confirmed by Hardy¹ for the herring *Clupea harengus* L. on account of another alga *Rhizosolenia*. *Rhizosolenia* caused 'weedy water' or 'Dutchman's baccy juice', as skippers of fishing vessels named it. The exact reason for the avoidance by the fishes of the algal patches was not known.

However, Panikkar² has given details of mass mortality of fishes in the Arabian Sea between 1955-58, and observed that on the Indian coast the cause of the mortalities is the rapid increase

in population of the dinoflagellate, *Noctiluca* in particular, and the blue-green alga *Trichodesmium*; these occurred during the months of June, January and October between Longitudes 60° E. and 64° E, and Latitudes 9° N. and 22° N. chiefly: these being precisely the regions associated with upwelling and high productivity, but it remained to be established in every instance whether the mortality had been the result of the planktonic 'bloom' or of direct influence of upwelled oxygen-depleted water. He mentioned that the large-scale destruction of shoals of fish reported in the mid-Arabian Sea were more likely to be caused by the surfacing of oxygen-depleted water, as evidenced from the I.N.S. KISTNA data figures.

Minicoy Island lies between Lat. 8° 15' N. and 8° 20' N. and Long. 73° 0' E. and 73° 4' E., but no mortality (such as seems to be so characteristic in the case of upwelling of oxygen-depleted water) was to be seen, and it is more likely that the tunas completely avoided the area occupied by the algal 'bloom' due to some other reason.

I am thankful to Dr. R. Raghuprasad, C.M.F.R. Substation, Ernakulam, for help in identifying the alga.

Central Marine Fisheries Research Unit,
Minicoy, October 21, 1967.
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1. Hardy, A. C., *The Open Sea: The World of Plankton*. Collins, Lond., 1956, pp. xv + 335; see p. 293
2. Panikkar, N. K., "Fishery Resources of the Indian Ocean," *Proc. II International Oceanogr. Congress, Moscow, May-June 1966. Sect.: Oceanography of the Indian Ocean and Antarctic*, 1966, pp. 1-27.

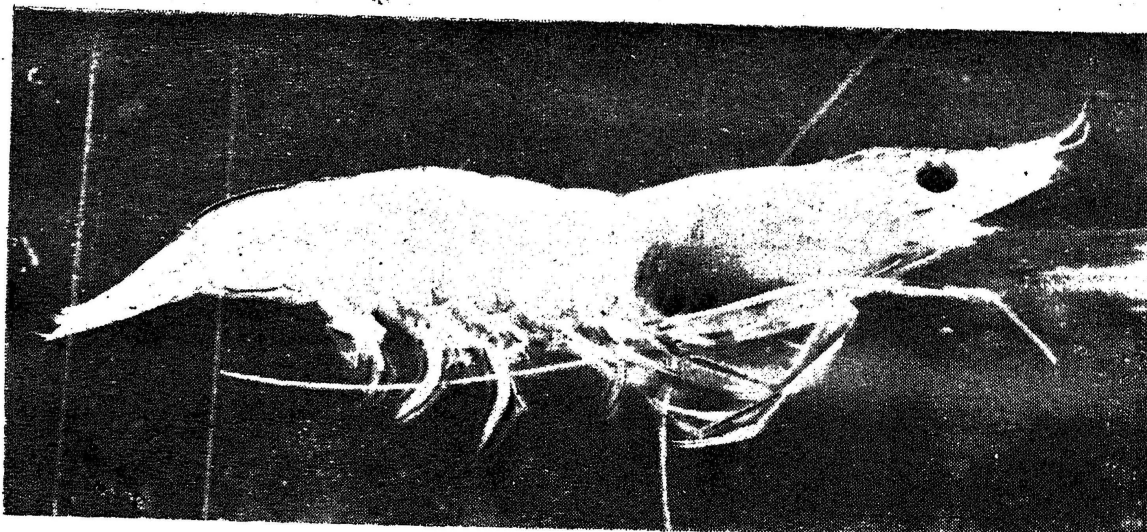


FIG. 1. Injected shrimp *M. affinis* showing branchial region stained.