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LOW LETHAL TEMPERATURES OF THE FISHES *LIZA MACROLEPIS* (SMITH) AND *TILAPIA MOSSAMBICA* PETERS

FRY and Associates[1-3] have made notable contributions in the field of temperature tolerance and resistance of fishes. While the high lethal levels of temperature of the group have been much explored there is more to be known about their low temperature deaths.[2] Results of preliminary experiments on low lethal temperatures of two species of fishes, *Liza macrolepis* and *Tilapia mossambica*, both of which occur together in the brackish waters around Mandapam and are being used for fish culture, are reported here.

Both the mullet and *Tilapia* were acclimated to fresh water at 30 ± 1° C for about two weeks before testing them. In all experiments, except in one, lots of 10 fish were exposed to cold temperatures by abrupt transfer from the water of acclimation to fresh water cooled to the test temperature (precision : ± 0·2° C) by adjusting the temperature inside a cold room. The water in the test tank was aerated to maintain adequate oxygen level.

The experimental fish (mullet : T.L.–5·5-12·5 cm.; *Tilapia* : T.L.–7·5-10·5 cm.) were exposed to three test temperatures, namely, 14·5, 16 and 18° C.

In Fig. 1 A and B plots of percentage of fish died (in probits) against logarithm of time to death in minutes at each test temperature are given. This method of studying lethal temperature relations, in terms of dosage-mortality results, has been justified by earlier workers and it has been shown that to plots as those in Fig. 1 usually straight lines can be fitted.[1,2]

None of *Tilapia* tested died within three days (longest test period) at 18° C, whereas at the same temperature all the mullets tested died within 2505 minutes. This fact and the comparison of the median lethal times (time to 50% mortality) as could be obtained from the figure clearly indicate that *Tilapia* is more resistant to cold temperatures than the mullet.

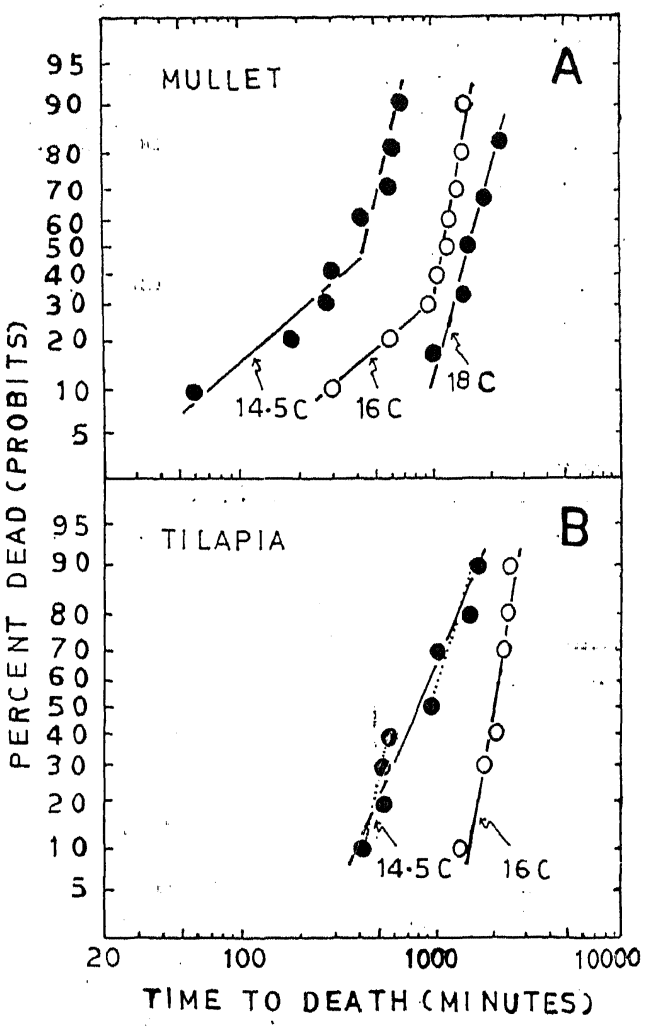

FIG. 1. Time to death at various low lethal temperatures in *Liza macrolepis* (A) and *Tilapia mossambica* (B). Both species were acclimated to fresh water at 30° C and tested in fresh water.

It may be noted that in Fig. 1 A, which shows the plots for the tests with mullet, scatters of points for tests at 16 and 14·5° C suggest that single straight lines cannot be fitted through as in the case of the points for 18° C. Therefore, two separate straight lines are drawn through the points for the lower temperatures, by inspection. Brett[2] also encountered similar phenomenon while dealing with low temperature deaths in salmonids and suggested that such split probits may be due to some factor besides temperature influencing the deaths of the fish. Brett showed that the factor in question could be salinity, the change in the rate of dying of the fish being caused by the failure of the osmoregulatory capacities. Salinity may be the factor involved in causing the split probits in the case of the mullets as well, which has to be verified by future tests. In Fig. 1 B the results of tests with *Tilapia*