

COLD ADAPTATION OF M₄ LACTATE DEHYDROGENASE FROM
THE ANTARCTIC FISH, *TREMATOMUS BERNACCHII*
(ABSTRACT)

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Kinetic and some chemical properties of M₄ lactate dehydrogenase (LDH) purified from Antarctic fish, *Trematomus bernacchii* were compared with those of the corresponding enzymes from carp and rabbit. Polyacrylamide gel electrophoresis, amino acid analysis and thermal stability measurement did not show a significant difference in a structural feature of M₄ LDH between the Antarctic fish and other vertebrates. The Michaelis constant (K_m) and catalytic rate constant (k_{cat}) of the Antarctic fish LDH were higher than two other enzymes at all assay temperatures (5–30°C), indicating its lower affinity for pyruvate and a greater catalytic efficiency. The temperatures giving maxima in k_{cat}/K_m values were related to the physiological temperatures at which the enzymes function. Further, the Antarctic fish enzyme gave the lowest enthalpy and entropy of activation. These kinetic characteristics of the Antarctic fish enzyme appear to reflect the adaptation to the cold environment.

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