Amazon fish LDH as model for studies of temperature adaptations

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Amazon is synonymous of an environmental diversity that includes many physiographic formations. Seasonal changes of river water levels (flood pulses) impose all sort of biological challenges to plants and animals. Lactate dehydrogenase (LDH) occurs in all forms of life, from bacteria to vertebrates and human, and catalyzes the interconversion of pyruvate to lactate in cells under hypoxia. LDH is encoded by three loci in fish: Ldh-A, Ldh-B, and Ldh-C. Conserved Ldh-A grouped with other tropical and sub-tropical sequences in an unrooted phylogenetic tree based on eight Amazon fish and other species' sequences deposited in NCBI data bank and resulted in three branches: temperate and artic; subtropical; and tropical fishes. Adaptation of psychrophilic fish Ldh-A involves low Km, high activation energy and structural molecular flexibility. *In silico* modeling of LDH-A peptide resulted in a conserved structure with high thermostability properties, which enable thermophilic fish species live in warm hypoxic tropical environments. (CT-AM – CNPq; INCT ADAPTA – CNPq & FAPEAM).