

Metabolic adaptation of aquatic animals – Adaptacje metabolizmu zwierząt wodnych

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In contrast to mammals skeletal muscle mitochondria, crustacean and fish mitochondria oxidize malate as the only added substrate, at a high rate. It can be assumed that malate is the central compound of intermediary metabolism participating in the bioenergetics of aquatic animals. The mitochondria isolated from the muscle of the crayfish and fish, exhibit, a high activity of malic enzyme. These results suggested that malic enzyme is important in the mitochondrial metabolism of aquatic animals. Assuming that malic enzyme is responsible for the conversion of malate to pyruvate within the intramitochondrial space, it could be expected that this reaction permitted malate oxidation as the only added substrate and the mitochondria which possess high activity of this enzyme should oxidize malate very rapidly. Some of the catalytic and physico-chemical properties of different molecular forms of malic enzyme are reviewed.