Purification and characterization of two isoapyrases from Solanum tuberosum var. ultimus

Kettlun, Ana María

Urra, Raúl

Leyton, Mario

Valenzuela, M.Antonieta

Mancilla, Marta

Traverso-Cori, Aída

Two isoenzymes of ATP-diphosphohydrolase (apyrase) were extracted and purified from S. tuberosum var. Ultimus. Their hydrolytic activity ratios (ATPase/ADPase) were 1.0 (apyrase B) and ca 15.0 (apyrase A). They were characterized and compared with apyrases of other varieties of S. tuberosum. Ultimus apyrases, like the other apyrases, did not hydrolyse esteric bonds but only pyrophosphate bonds of organic and inorganic compounds. The optimum pH of all the studied hydrolytic activities of the Ultimus apyrases A and B was 6, except for the ADPase of enzyme A which was 8. Both enzymes require bivalent metal ions for catalytic activity. The activation order for both Ultimus enzymes was: Ca2+>Mn2+> Mg2+>Co2+>Zn2+. Chemical modification of tryptophan, tyrosine, arginine and carboxylic residues decreased all enzymic activities of both apyrases. The modification of histidine residues reduced the ATPase and ADPase activities of the low ratio apyrase and the ATPase of the high ratio enzyme but di