

P-TYPE H⁺-ATPASE ACTIVITY AS A TOOL TO EVALUATE THE CLIMATERIC STAGE OF PAPAYA

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The ethylene is an important phytohormone for fruit maturity. The papaya is a climateric fruit, exhibiting a typical peak of ethylene production. In plant cells a P-type H⁺-ATPase couples ATP hydrolysis to generate an electrochemical gradient of H⁺ through the plasmalemma, which in turn energizes the membrane transport of many ions and regulates cellular pH. In the present work we study the climacteric stage of papaya fruits (*Carica papaya* L.), investigating the H⁺-ATPase activity and the related pH status of the apoplastic fluid extracted from mesocarp of fruits in different maturation stages. The ATP hydrolysis catalyzed for H⁺-ATPase exhibited a striking inhibition in the 2nd day of storage coincidently with the ethylene peak and a sudden transient apoplast alkalinization. Such inhibition indicates progressive cell membrane deenergization during the ripening and senescence processes occurring concomitantly with the decrease of membrane integrity and firmness of the fruits. The H⁺-ATPase activity and related changes in pulp acidity and apoplastic acidification are discussed in respect to a possible influence in cell wall plasticity and cell turgor. The data indicate the P-type H⁺-ATPase as a new biochemical marker that could be useful for post harvesting managements of climateric fruits.