ONLINE ISSN : 1349-1008
PRINT ISSN : 1343-943X

Plant Production Science
Vol. 8 (2005) , No. 4 383-392

Effects of KCN, SHAM and Oxygen Concentrations on Respiratory Properties of Purified Mitochondria Isolated from *Ananas comosus* (Pineapple) and *Kalanchoë daigremontiana*

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(Received: July 7, 2004)

Abstract: Effects of potassium cyanide (KCN), salicylhydroxamic acid (SHAM), and oxygen concentrations on mitochondrial respiration were investigated in purified mitochondria of a typical phospho*enol*pyruvate carboxykinase (PCK) crassulacean acid metabolism (CAM) plant *Ananas comosus* (pineapple) and a typical malic enzyme (ME)-CAM plant *Kalanchoë daigremontiana*. Mitochondria of *A. comosus* oxidized succinate and NADH faster than that of K. *daigremontiana*. Succinate and NADH oxidations in mitochondria of both species were partially inhibited by KCN and SHAM, indicating that these oxidations were connected to cytochrome and alternative pathways in their electron transport chain (ETC). NADH oxidation was more sensitive to KCN than succinate oxidation, suggesting that the ETC from NADH oxidation was less connected to the alternative pathway than that from succinate in mitochondria of both species. Concurrent oxidation of succinate and NADH resulted in much higher rates of cytochrome and alternative respirations than each individual oxidation alone in both species. NADH oxidation in *A. comosus* mitochondria was more connected to the cytochrome pathway, so *A. comosus* could produce much more ATP than *K. daigremontiana*. This capacity might be one of the fitting mechanisms of *A. comosus* to produce a sufficient amount of ATP for cytosolic PCK in the daytime. In addition, the reduction of oxygen concentrations decreased not only the cytochrome respiration, but also the alternative respiration on succinate oxidation in mitochondria of both species, and the decrease was greater in *K.*

daigremontiana than in *A. comosus*.

Keywords: Alternative pathway, *Ananas comosus*, Cytochrome pathway, *Kalanchoë daigremontiana*, Mitochondria, Oxygen

To cite this article:

Hoang Thi Kim Hong, Akihiro Nose and Sakae Agarie: "Effects of KCN, SHAM and Oxygen Concentrations on Respiratory Properties of Purified Mitochondria Isolated from *Ananas comosus* (Pineapple) and *Kalanchoë daigremontiana*". Plant Production Science, Vol. **8**, pp.383-392 (2005) .

doi:10.1626/pps.8.383

JOI JST.JSTAGE/pps/8.383