CHANGES IN PEROXISOMAL METABOLISM DURING *Z. AETHIOPICA* SPATHE SENESCENCE AND REGREENING: DIFFERENTIAL EXPRESSION OF TWO CATALASE GENES

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Introduction: *Zantedeschia aethiopica* spathe undergoes whitening displaying the common features of foliar senescence. After pollination, the spathe region surrounding the fruits undergo regreening, thus reacquiring photosynthetic ability. In this work, changes in peroxisomal metabolism were studied in what concerns key-enzymes of glyoxylate and glycolate pathways. Putative roles for CAT1 and CAT2 are discussed.
Material and Methods: Spathes during the time course of senescence and regreening were harvested from field-grown plants. The content in hydrogen peroxide (H_2O_2) followed Loreto et al (2001). Catalase activity was determined by following the decomposition of H_2O_2 at 240 nm (Aebi, 1983). Northern analysis was performed using *Z. aethiopica Cat1* (AF207906) and *Cat2* (AF332973) cDNAs as homologous probes. The activity of the glyoxysomal-marker enzyme isocitrate lyase (ICL) and leaf-type peroxisomal marker enzyme hydroxypyruvate reductase (HPR) were determined according to Zelitch (1988) and Liang et al. (1984), respectively.
Results and Conclusions: Changes in ICL and HPR activitiy suggest that during *Z. aethiopica* spathe development there is an induction of glyoxysomal metabolism during the late stages of whitening, followed by the induction of leaf-type peroxisome metabolism during regreening. In addition, the levels of H_2O_2 during the initial stages of spathe whitening seems to paralell catalase activity. As the transcript levels of *Cat1* increase until the late stages of spathe whitening, CAT1 is probably associated to scavenging of glyoxysomal H_2O_2. The higher expression of *Cat2* during spathe regreening suggests that CAT2 is specifically associated to photorespiratory H_2O_2 decomposition. However, as *Cat1* expression is also strongly induced during regreening, a dual role of CAT1 in scavenging leaf-type peroxisomal and glyoxysomal H_2O_2 can also be considered.
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