

The dormancy-breaking stimuli "chilling, hypoxia and cyanamide exposure" up-regulate the expression of α -amylase genes in grapevine buds

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It has been suggested that respiratory stress is involved in the mechanism underlying the dormancy-breaking effect of hydrogen cyanamide (H_2CN_2) and sodium azide in grapevine buds; indeed, reductions in oxygen levels (hypoxia) and inhibitors of respiration promote bud-break in grapevines. In this study, we showed that, hypoxia increased starch hydrolysis soluble sugar consumption and up-regulated the expression of α -amylase genes ($\text{Vv}\alpha\text{-AMYs}$) in grapevine buds, suggesting that these biochemical changes induced by hypoxia, may play a relevant role in the release of buds from endodormancy (ED). Three of the four $\text{Vv}\alpha\text{-AMY}$ genes that are expressed in grapevine buds were up-regulated by hypoxia and a correlation between changes in sugar content and level of $\text{Vv}\alpha\text{-AMY}$ gene expression during the hypoxia treatment was found, suggesting that soluble sugars mediate the effect of hypoxia on $\text{Vv}\alpha\text{-AMY}$ gene expression. Exogenous applications of soluble sugars and sugar analogs confirmed this finding and r