二次過氧化氫前處理誘導綠豆植株獲致比擬於冷馴化之低溫耐受性

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摘 要

以綠豆植株 (Vigna radiata L. cv. TN5) 處理200 mM過氧化氫再經4 oC，36小時的低溫測試以評估植株之低溫耐受性。發現重複處理過氧化氫得到較1次處理過氧化氫佳之低溫抗性，且以間隔3小時重複處理過氧化氫所得到的電解滲漏率最低，相近於經10oC, 48小時冷馴化處理的植株。以2次過氧化氫前處理隨即誘導麩胱甘?累積，且累積量高於控制組、1次過氧化氫，甚至是冷馴化處理的植株。經過氧化氫處理所誘導綠豆植株之麩胱甘?累積量不受光照所影響；然而經光照之冷馴化處理植株則明顯降低麩胱甘?含量。於過氧化氫處理前，以鈣離子螯合劑EGTA或glutathione (GSH) 生合成抑制劑BSO處理綠豆植株，均導致電解滲漏率提高，逆轉其抗寒能力，但無顯著影響麩胱甘?累積。以細胞內鈣離子抑制劑ruthenium red處理對電解滲漏率麩胱甘?累積並無顯著影響。經實驗結果暗示，過氧化氫處理綠豆植株所生成的訊號回應中，細胞外鈣離子與麩胱甘?於其中扮演著重要角色。以冷馴化處理所誘導植株低溫抗寒訊息傳遞中，可能經光依賴（light-dependent）及光不依賴（light-independent）之訊息傳遞調節。

關鍵詞 : 過氧化氫、麩胱甘?、低溫耐受性、鈣離子、冷馴化

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