园艺学报 » 2013, Vol. 40 » Issue (3) :417-425 DOI:

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低温对仁用杏雌蕊抗坏血酸—谷胱甘肽循环的影响低温对仁用杏雌蕊抗坏血酸—谷胱甘肽循环的影响

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Effects of Low Temperature Stress on Ascorbate-glutathione Cycle in Kernel Apricot Pistil

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摘要 利用人工智能模拟霜箱，设8 个温度（18、－1、－2、－3、－4、－5、－6、－7 ℃），对抗寒性不同的两个仁用杏（*Prunus armeniaca* Linn.）品种雌蕊的过氧化氢（H_2O_2）含量和抗坏血酸—谷胱甘肽（AsA-GSH）循环进行了研究。结果表明，低温胁迫增加了仁用杏雌蕊H_2O_2 含量，－7 ℃时抗晚霜品种‘围选1 号’和晚霜敏感品种‘龙王帽’分别为对照（18 ℃）的 5.49 倍和7.22 倍。低温期间，‘围选1 号’雌蕊AsA 等酶含量及APX 等酶活性均高于‘龙王帽’，－7 ℃时，‘围选1 号’雌蕊AsA、MDHA、DHA、GSH 和GSSG 含量比对照分别下降了66%、69%、48%、52%、53%，‘龙王帽’下降了78%、79%、59%、66%、65%，－7 ℃时，‘围选1 号’雌蕊APX、MDHAR、DHAR、GPX、GR 活性、AsA/DHA、GSH/GSSG 分别是对照的2.87 倍、1.07 倍、1.42 倍、1.60 倍、1.20 倍、65%和1.03 倍，‘龙王帽’是对照2.41 倍、96%、1.13 倍、1.08 倍、98%、54%、97%。结果表明‘围选1 号’雌蕊在低温期间有较高的AsA-GSH循环效率，可有效抑制H_2O_2 的积累，这可能是其抗晚霜能力较强的重要原因之一。

关键词： 仁用杏 雌蕊 低温胁迫 AsA-GSH 循环

Abstract: The peroxide（H_2O_2）content and ascorbate（AsA）-glutathione（GSH）cycle in pistil of two kernel apricot（*Prunus armeniaca* Linn.）cultivars under different low temperature（18，－1，－2，－3，－4，－5，－6，－7 ℃）were studied using the artificial climate chamber. The results show that H_2O_2 contents in kernel apricot pistilincreased under the low temperature stress，at－7 ℃，the amount of ‘Weixuan 1’ resistant to cold stress was 5.49 times more than control（18 ℃），the amount of ‘Longwangmao’ susceptible to cold stress was 7.22 times more than the control. The content of enzyme like AsA and so on and activity of enzyme like APX and so on in ‘Weixuan 1’ pistil were higher than those in ‘Longwangmao’ under low temperature，at－7 ℃，the contents of AsA，MDHA，DHA，GSH and GSSG were decreased by 66%，69%，48%，52%，53% compared to the control（18 ℃）in ‘Weixuan 1’ pistil，were decreased by 78%，79%，59%，66%，65% compared to control（18 ℃）in ‘Longwangmao’ pistil. At－7 ℃，the activity of APX，MDHAR，DHAR，GPX，GR，GSH/GSSG were 2.87，1.07，1.42，1.60，1.20，1.03 times more than control（18 ℃）respectively. AsA/DHA was 65% of the control in ‘Weixuan 1’ pistil. The activity of APX，DHAR，GPX were 2.41，1.13，1.08 times more than control（18 ℃）. MDHAR，GR，AsA/DHA，GSH/GSSG were 96%，98%，54%，97% of the control respectively in ‘Longwangmao’ pistil. The results indicate that ‘Weixuan 1’ pistil could maintain efficient metabolism of AsA-GSH cycle，inhibit the accumulation of H_2O_2 effectivity，this might be one of important reasons for higher cold tolerance of ‘Weixuan 1’.

Keywords: kernel apricot, pistil, low temperature stress, AsA-GSH cycle

引用本文:

王 萍, 李彦慧, 张雪梅等 .低温对仁用杏雌蕊抗坏血酸—谷胱甘肽循环的影响低温对仁用杏雌蕊抗坏血酸—谷胱甘肽循环的影响[J] 园艺学报, 2013,V40(3): 417-425

WANG Ping, LI Yan-Hui, ZHANG Xue-Mei etc .Effects of Low Temperature Stress on Ascorbate-glutathione Cycle in Kernel Apricot Pistil[J] ACTA HORTICULTURAE SINICA, 2013,V40(3): 417-425

没有本文参考文献

[1] 李 亮, 董春娟, 尚庆茂.内源水杨酸参与黄瓜叶片光合系统对低温胁迫的响应[J]. 园艺学报, 2013,40(3): 487-497

[2] 田景花, 王红霞, 张志华, 高仪.低温逆境下两个抗寒性不同的核桃幼叶 Ca^{2+}的亚细胞定位的变化[J]. 园艺学报, 2013,40(3): 441-448

[3] 陈虎, 何新华, 罗聪, 杨丽涛, 黄杏, 胡颖.低温胁迫下龙眼碳酸酐酶基因（*CA*）的克隆与表达分析[J]. 园艺学报, 2012,39(2): 243-252

[4] 薛锡佳, 李佩艳, 宋夏钦, 沈玫, 郑小林.草酸处理减轻杧果采后果实冷害的机理研究[J]. 园艺学报, 2012,39(11): 2251-2257

[5] 柏素花, 祝军, 戴洪义.苹果酰基辅酶A结合蛋白2 编码基因*MdACBP2*的克隆和表达分析[J]. 园艺学报, 2012,39(10): 1893-1902

[6] 徐红霞;陈俊伟;杨 勇;孙骏威;严成其 .枇杷果实*DHN*基因克隆及其在低温胁迫下的表达分析 [J]. 园艺学报, 2011,38(6): 1071-1080

[7] 田丹青;葛亚英;潘刚敏;沈晓岚;何 勇;张 智;刘晓静;朱祝军;.低温胁迫对3个红掌品种叶片形态和生理特性的影响 [J]. 园艺学报, 2011,38(6): 1173-1179

[8] 李超汉;张 琳;史庆华;李青竹;郭晓青;李 霞;于贤昌;.GMPase超表达对番茄植株抗坏血酸含量及耐冷性相关生理指标的影响 [J]. 园艺学报, 2011,38(4): 692-70

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