

园艺—应用研究

套袋和抑制剂处理对桃果皮中葡萄糖-6-磷酸脱氢酶以及花色苷的影响

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摘要:

研究套袋处理和细胞G6PDH活性抑制剂-脱氢异雄酮(DHEA)涂抹处理,探讨桃果实着色过程中G6PDH、PAL活性与花色苷的关系。以‘早玉’桃(*Prunus persica* L. Batsch cv. ‘zaoyu’)为试材,研究了套袋对果皮花色苷、G6PDH和PAL活性、G6PDH亚细胞分布的影响,也试用DHEA处理,观察果皮颜色变化,并测定果皮中G6PDH活性和花色苷含量。自然生长的果实中,花色苷与G6PDH、PAL活性变化趋势相同;套袋果实摘除套袋后,G6PDH和PAL活性、花色苷都迅速增加,而未摘掉套袋的果实中,G6PDH、PAL活性和花色苷的含量基本没有变化;果实G6PDH主要存在于细胞质和质体(转色前为叶绿体,而转色期为杂色体)中,套袋使得叶绿体狭长,而且发生叶绿体裂殖;果实质体中胶体金颗粒数量与G6PDH活性变化一致;脱氢异雄酮(DHEA)处理降低了G6PDH活性,花色苷含量也明显减少。套袋处理果实中G6PDH、PAL活性和花色苷有一定的相关关系,抑制G6PDH的活性能够抑制花色苷的合成。进一步表明G6PDH在果实花色苷合成中具有关键作用。

关键词: 亚细胞定位

Influence of Fruit Bagging and DHEA on Glucose-6-phosphate Dehydrogenase and Anthocyanin of Peach Fruit

Abstract:

This experiment was carried out to study the relationships among glucose-6-phosphate dehydrogenase (G6PDH), phenylalanine ammonia-lyase (PAL) activity and the concentrations of anthocyanin, by using fruit with bagging and DHEA treatment. Fruits from nine-year-old peach trees (*Prunus persica* L. Batsch cv. ‘zaoyu’) were used as materials in this study. Fruits were bagged at the pit-hardening stage (with removed and without), non-bagged were used as control. And the concentration of anthocyanin, the activities of PAL and G6PDH, subcellular localization of G6PDH were observed. Also, with DHEA treatment, the color of fruit, the activities of G6PDH and anthocyanins were checked. The changes of anthocyanins and the activities of PAL and G6PDH in non-bagged fruit presented similar patterns. The activity and amount of G6PDH in bagged fruits reached a peak under sunlight irradiation, and at the same time the anthocyanin accumulation increased rapidly, but the G6PDH remained active and constant in fruits with bags all through, whereas no anthocyanin produced. By EM immunogold localization, G6PDH resided in cytoplasm and plastids (named chloroplast at an early stage of fruit growth when fruits were green and named chromoplast at the beginning of coloring), the chloroplasts were gracile and procreated by cleavage in bagged fruits. The amount of immunogold particles was coincident with the changes of G6PDH activities. DHEA could inhibit the activity of G6PDH in peach fruit, and which caused a decrease in anthocyanin production. The G6PDH was one of key enzymes controlling anthocyanin biosynthesis.

Keywords: subcellular localization

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