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论文

甜高粱蔗糖合酶表达与蔗糖积累的相关分析

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摘要：

以甜高粱为原料生产酒精是一种有潜力的生物能源途径，了解甜高粱蔗糖积累机理对生物能源开发具有重要意义。以两个甜高粱品种为材料，利用Western blotting技术检测高粱叶片和茎秆中蔗糖合酶(Sucrose Synthase, SS)的表达，分析其与蔗糖积累的相关性。结果表明，甜高粱叶片和茎秆中的SS蛋白质表达量在发育早期(拔节期、抽穗期)较低，发育后期(开花期、灌浆期和腊熟期)明显升高，在开花期最高。同2个普通高粱品种相比，在发育后期2个甜高粱品种叶片和茎秆中SS的表达明显增加，且与茎秆中的蔗糖积累相关，推测这是甜高粱与普通高粱蔗糖含量差异的重要原因。试验结果为选育甜高粱品种和提高茎秆蔗糖含量提供了一条可能的策略。

关键词： 甜高粱 普通高粱 蔗糖合成酶 Western blotting

Correlation Analysis between Sucrose Synthase Expression and Sucrose Accumulation in Sweet Sorghum(*Sorghum bicolor* L.Moench)

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Abstract:

Alcohol production by using sweet sorghum (*Sorghum bicolor* L. Moench) might be a potential way to provide bio-energy in the future, so it is necessary to learn about the mechanism of sucrose accumulation in sweet sorghum for exploitation of bio-energy. The experiment was conducted using two sweet sorghum varieties, to detect expression of sucrose synthase (SS) in leaves and stems by using Western blotting, and analyse the correlation between SS expression and sucrose accumulation. The results indicated that the SS expression in sweet sorghum leaves and stems was lower at early growth stages (jointing and heading stage), increased dramatically at late growth stages (flowering, grain filling and dough stage), and reached the highest level at flowering stage. Compared with two common sorghum varieties, SS expression in leaves and stems in two sweet sorghum varieties increased significantly at late growth stages and correlated with sucrose content in stems. Expression of SS might play an important role in the difference of sucrose content between sweet and common sorghums. The results proposed a strategy for screening sweet sorghum cultivars and enhancing sucrose content of stems in breeding program.

Keywords: Sweet sorghum Common sorghum Sucrose synthase Western blotting

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