Effects of Weak Light on Starch Accumulation and Starch Synthesis Enzyme Activities in Rice at the Grain Filling Stage [PDF]

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摘 要：Dynamic changes of starch, amylose, sucrose contents and the activities of starch synthesis enzymes under shading treatments after flowering were studied using two rice varieties IR72 (indica) and Nipponbare (japonica) as materials. Under shading treatments, the starch, amylose and sucrose contents decreased, while ADP-glucose pyrophosphorylase (ADPGPPase) activity only changed a little, soluble starch synthase activity and granule bound starch synthase activity decreased, soluble starch branching enzyme (SSBE, Q-enzyme) activity and granule bound starch branching enzyme (GBSBE, Q-enzyme) activity increased, and starch debranching enzyme (DBE, R-enzyme) activity varied with varieties. Correlation analyses showed that the changes of starch content were positively and significantly correlated with the changes of sucrose content in the weak light. Both ADPGPPase activity and SSBE activity were positively and significantly correlated with starch accumulation rate. It was implied that the decline of starch synthase activities was related to the decrease of starch content and the increase of the activity of starch branching enzyme played an important role in the decrease of the ratio of amylose to the total starch under the weak light.

关键词：weak light; starch content; ADP-glucose pyrophosphorylase; starch synthase; starch branching enzyme;

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