Low Light Stress Influences Resistant Starch Content and Glycemic Index of Rice (O. sativa L)

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Low light (LL) stress is an important abiotic stress of wet season which adversely affects starch biosynthesis and results in drastic reduction in rice grain yield. In general, the grain yield decreases together with reduction in the amylose (AC) and resistant starch (RS) contents while the glycemic index (GI) values increased in plants exposed to LL stress. This is the first report of the effect of LL stress on RS and GI values. In the present investigation, 14 rice genotypes are studied for the effect of LL stress on AC, RS, and GI of the grains. Rice genotypes, Purnendu and Shashi differ in exhibiting relatively much lower reduction in AC and RS and hence little change in their GI values under LL stress, while wide variation is observed for the rest of the genotypes. The grain yields of Purnendu and Shashi are also not much affected by the LL stress. There is a dramatic increase in the expression levels of the gbssI in the middle stage of grain development in the two genotypes (Purnendu and Mahisugandha with contrasting RS, AC, and GI). Maximum expression of the gene was observed in Purnendu at middle stage showing a positive correlation between RS and gbssI expression. As rice is grown mainly in wet season, the identification of rice genotypes which do not permit much change in RS value when grown under LL and hence no significant increase in the GI value, would help to develop better rice varieties for consumption by diabetics.

Biography

Darshan Panda has completed his PhD from Ravenshaw Univerity, Cuttack Odisha and currently working as a senior research fellow at ICAR-National rice research instutire, Odisha.