

The objective of the study was to determine the patterns of expression of two photosynthetic genes *rbcl* and *psbA*, during chloroplast and chromoplast differentiation in fruit tissues of three Cucurbitae pepo L. cultivars: Early Prolific, Foodhook Zucchini and Bicolor Gourds. In two Early Prolific isogenic lines, YYBB and YYB+B+, the steady-state amounts of *rbcl* and *psbA* transcripts increased with fruit development upto 14 days post-pollination. The YYB+B+ line in which chloroplast differentiates into chromoplast at about pollination, did not show significantly higher amounts of both transcripts compared to YYBB, in which chromoplast develops early prior to pollination. In the Bicolor Gourds, in which the chromoplast and chloroplast containing tissues lie in juxtaposition on the same fruit, showed little differences in *rbcl* and *psbA* transcripts between the two tissues, if any the chromoplast containing tissue contained more of both transcripts than the chloroplast containing tissue. In Fordhook Zucchini fruits, where the chloroplast containing tissue developed early prior to pollination and was maintained, the steady-state amounts of *rbcl* transcripts increased to a maximum at 3 days post-pollination and levelled at 14 and 21 days post-pollination. In contrast, in Fordhook Zucchini fruits, the *psbA* transcript increased gradually up to 21 days post-pollination. In Fordhook Zucchini, the apparent ratios of *psbA* transcripts versus *rbcl* transcripts ranged from 2.5 to 3.9, at day 3 to 21 post-pollination, while in Bicolor Gourds were 2.9 and 4.5 at days 14 and 21 post-pollination. The two photosynthetic genes, *psbA* and *rbcl* were developmentally regulated and differentially expressed. However, their expression in chloroplast containing fruit tissues was not higher than in the chromoplast containing fruit tissues.