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A Novel Lipocalin from Pepper: Its Gene Expression is Involved in Fruit Maturation

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Objectives

This work is to characterize a novel lipocalin gene (*PLC1*) of pepper.

Materials and Methods

1. Peppers and tomatoes used in this study were commercial lines (properties of Nong Woo Bio Co.).
2. Subtraction was performed using a PCR-select cDNA subtraction kit (Clontech, Palo Alto, CA), according to the manufacturers instructions. As a tester, cDNAs from red-ripe fruit of SIRO was synthesized using AMV reverse transcriptase, and as a driver, cDNAs from the breaker fruit of SIRO were synthesized.

Results and Discussion

We have isolated an expressed sequence tag (EST) collection that is differentially expressed in red ripe fruit of *Capsicum annuum* cv. SIRO by suppression subtractive hybridization (SSH). One of the clones, named *PLC1* (pepper lipocalin 1; accession no. CB165063), was sequenced completely. Southern blot showed that the pepper genome contained a single copy of the *PLC1* gene. Surprisingly, *PLC1* was only expressed in pericarp and placenta of red ripe fruit indicating that it is regulated tissue specifically. In addition, the *PLC1* transcripts were detected in breaker fruits (green and red stage) and red ripe fruits and not detected during green fruit development indicating that *PLC1* gene is regulated developmentally in fruit. The PLC1::smGFP fusion protein was observed at the membrane, but not in the cytoplasm, indicating that PLC1 is a plasma membrane protein. We report here that the PLC1 represents the first plant lipocalin that probably plays a role in fruit maturation.

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