

Changes in expression patterns of anthocyanin biosynthesis genes influence fruit colour in purple-fruited peppers during ripening

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The purple fruit colour of several *Capsicum* cultivars is due to the accumulation of anthocyanin delphinidine derivatives in the peel. Except some pepper cultivars, during fruit ripening, the exocarp changes colour from purple to red due to the anthocyanin content decrease and carotenoid accumulation. In the present study, dynamics of the anthocyanin content was determined in fruit peel during ripening in purple-fruited pepper cultivars - *C. annuum* (cv. Sirenevii kub), *C. chinense* (cv. Pimenta Da Neyde), and *C. frutescens* (cv. Samocvet). In cv. Pimenta Da Neyde fruit peel, which was purple coloured at all developmental stages, the anthocyanin content gradually increased, reaching a maximum in the mature fruit (4.7 mg/g FW). In the other two studied pepper cultivars, only immature fruit had a purple colour, the anthocyanin content in the peel decreased as the fruit ripened, and mature fruit turned red. The obtained data were compared with the expression pattern of key anthocyanin biosynthesis structural genes *CHS*, *F3'5'H*, *DFR*, *ANS*, and *UGT*, as well as regulatory genes of transcription factors MYB113 and MYC. It was found that the expression pattern of the studied genes correlated with the anthocyanin content in the peel of pepper fruits. Also, a positive relationship between the transcription levels of *MYB113* and *MYC*, and the anthocyanin biosynthesis structural genes was revealed. The study was supported by the Russian Science Foundation grant #19-16-00016.