

ANTHOCYANIN RESPONSE OF PURPLE BASIL TO SHORT-TERM LOW-TEMPERATURE STRESS

Aleksandrs Petjukevics¹, Inta Umbrasko¹, Anna Batjuka¹, Natalja Skute¹

¹Daugavpils University, Institute of Life Science and Technologies, Daugavpils, Latvia
aleksandrs.petjukevics@du.lv

One of the major abiotic stress factors is cold temperature stress, which affects plant metabolism and stress tolerance, particularly in thermophilic species such as basil (*Ocimum basilicum* L.). This study examined the effect of short-term cold stress (3 °C) on total anthocyanin accumulation in mature leaves of purple basil (*Ocimum basilicum* var. *purpurascens*, cv. Red Opal). Plants were grown to full commercial maturity under controlled conditions and exposed to low temperature for 24 h, followed by a recovery period. Total anthocyanin content was quantified spectrophotometrically using acidified methanol extracts. Cold stress induced a strong increase in anthocyanin concentration, with levels rising by approximately 88 % compared to non-stressed controls. During recovery, anthocyanin content declined but remained significantly higher than initial control values, indicating sustained activation of protective responses. These results suggest rapid induction of anthocyanin biosynthesis as part of the antioxidant defense system under chilling conditions. The findings demonstrate dynamic regulation of anthocyanins in purple basil during low-temperature stress and support their role in stress adaptation and potential use as biochemical markers of cold stress tolerance.

Keywords: anthocyanin, Cold stress, non-enzymatic antioxidant, *Ocimum basilicum* L.