144.

SUBTHEME 8: Pure and Applied Sciences for Climate Action

PRE-CONFERENCE PAPERS

149

145. Light-dependent chloroplast relocation in wild strawberry (*Fragaria vesca*)

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Abstract

Chloroplast photorelocation is a vital organellar response that optimizes photosynthesis in plants amid fluctuating environmental conditions. Chloroplasts exhibit an accumulation response, moving toward weak light to enhance photoreception, and an avoidance response, moving away from strong light to avoid photodamage. Although chloroplast photorelocation has been extensively studied in model plants such as *Arabidopsis thaliana*, little is known about this process in the economically important crop strawberry. Here, we investigated chloroplast photorelocation in leaf mesophyll cells of wild strawberry (*Fragaria vesca*), a diploid relative of commercially cultivated octoploid strawberry (*F. xananassa*). Microscopy observation revealed that the periclinal area of leaf mesophyll cells in *F. vesca* is considerably smaller than that of *A. thaliana*. Given this small cell size, we investigated chloroplast photorelocation in *F. vesca* by measuring light transmittance in leaves. Weak blue light induced the accumulation response, whereas strong blue light-induced the avoidance response. Unexpectedly, strong red light also induced the accumulation response in *F. vesca*. These findings shed light on chloroplast photorelocation as an intracellular response, laying the foundation for enhancing photosynthesis and productivity in *Fragaria.*

Keywords: *Chloroplast photorelocation, Wild Strawberry, Fragaria vesca*