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Poster Abstract - D.08

THE SHADE AVOIDANCE RESPONSE IN *ARABIDOPSIS THALIANA*

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Plants undergoing shade exposure, as an effect of close proximity of taller plants that absorb most of the Red (R) component and reflect a Far Red (FR)-enriched light, try to adapt to this energetically adverse condition by acting the so-called shade avoidance response. In several plants, this has been described as a re-direction of the energy towards stem elongation and flowering to the detriment of leaf expansion and root growth. In the model plant *Arabidopsis thaliana*, however, this process has been limitedly described (i.e. elongation response of petioles and stems, effects on flowering time). Here, we report the first comprehensive description of the shade avoidance response in *Arabidopsis*. The hypocotyl and petioles significantly increase their length, while cotyledons and leaves strongly slow down their expansion. The root system undergoes a reduction in growth rate upon exposure of the plant to shade, affecting both the primary and the lateral roots. At bolting, plants grown in shade are dramatically less developed with respect to plants grown in normal light conditions, including a reduced number of leaves. In addition, flowering is significantly accelerated in shade. Interestingly, we observed for the first time that shade specifically affects the development of the vascular system in leaves. By promoting the differentiation of the provascular and mesophyll cells, shade simplifies the final vascular network. We are currently exploiting molecular markers in order to study the effect of FR-rich light on leaf development. Moreover, the role of the phytohormone auxin and of the homeobox gene *ATHB-2* in this aspect of the shade avoidance response will be discussed.