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***Lemna trisulca*: Contribution to the Progress in Understanding the Mechanism of Chloroplast Movements**

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Chloroplasts relocate within cells to maximize energy capture under limiting light and/or to minimize exposure to excess light. In higher plants these movements are mediated by phototropins, blue light photoreceptors that control also other light acclimation processes. Chloroplast movements share many similarities between the aquatic angiosperm *L. trisulca* and *Arabidopsis thaliana*. These include fluence rate-response curves in continuous light and fluence-response profiles obtained with strong light pulses. In both species phosphoinositides and Ca^{2+} participate in signalling, with a greater role of calcium released from the internal stores. The signalling pathway leading to light-induced chloroplast movement may involve GLutamate Receptor-like (GLR) channels, previously shown to participate in light signalling in plants. These ligand-gated ion channels, structurally homologous to animal neurotransmitter receptors, are known to generate Ca^{2+} transients inside plant cells. We chose *L. trisulca* to determine the role of GLR channels in chloroplast movements using specific inhibitors. NMDA GLR channels were shown to participate in the control of chloroplast avoidance response in the duckweed. This control occurs in a pH-dependent way, similar to NMDA receptors operating in animal cells. As the avoidance response is activated only by strong blue light, these GLR channels are involved in the phototropin2 signalling pathway. GLR AMPA channels, previously shown to take part in seedling growth, proved inactive in chloroplast movements. Thus, we provided evidence that GLR receptors activated by different agonists have specialised functions in plants. Genetic modification of *L. trisulca* is desired to get further insight into the mechanism of its blue-light-induced chloroplast movements.

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References

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