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Authors: Agata Daszkowska-Golec, Anna Skubacz, Krzysztof Sitko, Michał Słota, Marzena Kurowska, Iwona Szarejko

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Mutation in barley *ERA1* (*Enhanced Response to ABA1*) gene confers better photosynthesis efficiency in response to drought as revealed by transcriptomic and physiological analysis

Running title: The role of *HvERA1* in barley drought response

Agata Daszkowska-Golec^{1*}, Anna Skubacz¹, Krzysztof Sitko², Michał Słota¹, Marzena Kurowska¹, Iwona Szarejko¹

¹Department of Genetics, Faculty of Biology and Environmental Protection, University of Silesia, Jagiellonska 28, 40-032 Katowice, Poland

²Department of Plant Physiology, Faculty of Biology and Environmental Protection, University of Silesia, Jagiellonska 28, 40-032 Katowice, Poland

*Corresponding author email: agata.daszkowska@us.edu.pl

Highlights

- Barley *ERA1* is a negative regulator of abscisic acid (ABA) signaling
- Potential regulatory role of barley *ERA1* under water stress is proposed
- At the onset of water stress *HvERA1* is involved in crosstalk between ABA and ethylene
- *hvera1.b* mutant exhibited better photosynthesis efficiency in response to drought
- *HvERA1* negatively regulates metabolism of chloroplast-membranes components (galactolipids) under water stress

Abstract

Farnesylation is a post-translational modification that promotes the interaction between the modified signaling protein and membrane lipids and/or other proteins. Farnesyltransferase is the crucial enzyme involved in this process. Strikingly, plant mutants in the *ERA1* (*Enhanced response to ABA 1*) gene, encoding β -subunit of farnesyltransferase, exhibited ABA-hypersensitivity during seed germination and drought tolerance in several species including *Arabidopsis*, wheat and soybean. However, the

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