

Exogenous 5-aminolevulinic acid increases the expression of Nar1 gene and nitrate reductase protein accumulation in barley seedlings.

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Abstract— The information on mechanisms and pathway of plant nitrogen assimilation by 5-aminolevulinic acid (ALA) is still limited. In addition, the molecular mechanism of nitrate reductase (NR) regulation in response to ALA treatment in plants has not fully been elucidated. In this study, we investigate the effect of different concentrations of exogenous ALA on expression, protein content and enzyme activity of NR in 7-day-old barley (*Hordeum vulgare* L.) seedlings grown in the presence of its substrate, KNO₃. Our data indicate that the inducible Nar1 gene is up regulated and protein content and enzyme activity also increase in leaves of barley seedlings treated with ALA. We suggest that ALA influences growth and development of barley plants by means of nitrate reductase regulation at the transcriptional and post-translational levels.

Keywords– 5-Aminolevulinic acid, *Hordeum vulgare* L., nitrate reductase, plant growth regulator, transcriptional and post-translational regulation