



Nitrogen metabolism in plants under low oxygen stress

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More frequent flooding and waterlogging events due to more heavy precipitation are expected worldwide in the context of climate change. Accordingly, adaptation of plants to oxygen limitation at both cellular and whole plant levels should be investigated thoroughly, that derived knowledge could be taken into account in breeding programs and agronomical practices for saving plant fitness, growth and development even when oxygen availability is low. In the present review, we highlight current knowledge on essential aspects of low oxygen stress-induced changes in nitrogen metabolism. The involvement of two possible pathways for NO production either via the reaction catalyzed by nitrate reductase or at Complex III or IV of the mitochondrial electron transport chain, thus contributing to ATP synthesis via the so-called nitrite-NO respiration, is discussed. NO is proposed to be scavenged by non-symbiotic hemoglobin (Hb) in a Hb/NO cycle, in which NAD(P)H is oxidized for the conversion of NO into NO₃(-). The investigation of an additional adaptation to the decrease in oxygen availability via transcriptional and posttranslational regulation of amino acid synthesis pathways, using publicly available transcriptome and translatome data for *Arabidopsis thaliana* and rice is also discussed.

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