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Long-term exposure to slightly elevated air temperature alleviates the negative impacts of short term waterlogging stress by altering nitrogen metabolism in cotton leaves

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Abstract

Short-term waterlogging and chronic elevated temperature occur frequently in the Yangtze River Valley, yet the effects of these co-occurring environments on nitrogen metabolism of the subtending leaf (a major source leaf for boll development) have received little attention. In this study, plants were exposed to two temperature regimes (31.6/26.5 °C and 34.1/29.0 °C) and waterlogging events (0 d, 3 d, 6 d) during flowering and boll development. The results showed that the effects of waterlogging stress and elevated temperature in isolation on nitrogen metabolism were quite different. Waterlogging stress not only limited NR (EC 1.6.6.1) and GS (EC 6.3.1.2) activities through the down-regulation of *GhNR* and *GhGS* expression for amino acid synthesis, but also promoted protein degradation by enhanced

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