III SINPROVS
III SIMPÓSIO NACIONAL DE ESTUDOS PARA PRODUÇÃO VEGETAL NO SEMIÁRIDO

LOW NH_4^+ ACCUMULATION IN LEAVES CONFERS TOLERANCE TO HIGH AMMONIUM CONCENTRATION IN UPLAND RICE PLANTS

BAIXA ACUMULAÇÃO DE NH_4^+ NAS FOLHAS CONFERE TOLERÂNCIA A ALTA CONCENTRAÇÃO DE AMÔNIO EM PLANTAS DE ARROZ DE SEQUEIRO

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The main nitrogen (N) sources uptake by plants are the inorganic forms, nitrate (NO_3^-) and ammonium (NH_4^+). Yet, few species, such as rice plants, can tolerate high NH_4^+ concentrations, as they had to develop many mechanisms to cope with the excess of this ion in paddy soils. Despite some of these mechanisms had been described involving lowland rice plants, the NH_4^+ tolerance in upland rice plants still poorly understood. Thus, the aim of this study was to verify if upland rice plants are tolerant to high NH_4^+ concentrations. Thus, 35-day-old rice plants (*Oryza sativa indica* cv. BRS Primavera), were exposed to 0, 5, 10 and 15 mM NH_4^+, as sole N source, over 21 days in greenhouse conditions. Control plants (0 mM NH_4^+) were cultivated with 10 mM NO_3^-, as sole N source. After 21 days, gas exchange parameters (CO_2 assimilation - P_N and stomatal conductance - g_S) and actual quantum efficiency of PSII (ΦPSII) did not change statically in any of treatments, but the 15 mM NH_4^+-exposed plants had lower P_N and ΦPSII when compared to control plants. The concentration of NH_4^+ in root tissues increased exponentially as the exogenous NH_4^+ content increased, reaching 238% more in 15 mM NH_4^+-treated plants than control ones. In leaf tissues, NH_4^+ content had the same response observed in roots, however showed much lower proportion accumulating only 125% more in 15 mM NH_4^+- than in 0 mM NH_4^+-supplied plants. In summary, upland rice plants can tolerate exogenous high ammonium concentrations as reported to lowland rice plants. This tolerance is conferred by exclusion mechanisms to shoot tissues and NH_4^+ compartmentalization in roots. However, further investigations are needed to better understand the mechanisms related to ammonium tolerance in upland in rice plants.

Keywords: CO_2 assimilation; Nitrogen source; *Oryza sativa*.

Acknowledgment: CNPq, CAPES e FUNCAP