TRANSCRIPTIONAL PROFILE ANALYSIS OF GENES RESPONSIVE TO TOXIC ALUMINUM IN ROOTS OF SIGNALGRASS

Chiari L[1], Santos BF[2], Salgado LR[1], Valle CB[1], Barrios SCL[1].

[1]Embrapa Beef Cattle, 830 Rádio Maia Avenue, Campo Grande MS 79106-550, Brazil, [2]Department of Plant Biology, Mato Grosso do Sul Federal University, s/n Cidade Universitaria, Campo Grande MS 79090-900, Brazil.

Aluminium (Al) toxicity is one of the major limiting factors for crop production on acid soils. Al toxicity inhibits root cell division and elongation, thus reducing water and nutrient uptake, consequently resulting in poorer plant growth and yield. *B. decumbens* Stapf cv. Basilisk is a forage grass which is widely sown in the tropics and is extremely Al tolerant. However, molecular mechanisms underlying this process are unknown. Exclusion and internal detoxification of Al have been suggested as two important mechanisms for Al tolerance in plants. This work evaluated the effects of Al on the transcriptional profile of two genes putatively involved in Al tolerance, by real time quantitative PCR, in roots of two genotypes of signalgrass(tolerant and sensitive). The genotypes were kept in hydroponic solution under two conditions: 200 µM $CaCl_2$, pH 4.2 (control) and 200 µM $CaCl_2$ + 200 µM $AlCl_3$, pH 4.2 (stressed) during 8h, 24h,48h and 72h. The candidate genes analyzed were: malate synthase (MS),a gene that encodes the malate which is Al-chelating and has an important role in the detoxification of Al both externally and internally; and a homologous to the OsALS1 gene from rice that encodes a half-size ABC transporter localized at the tonoplast, responsible for sequestration of Al into the vacuoles, which is required for internal detoxification of Al. The expression of the MS gene increased in the two genotypes understress conditions, but it was more expressed in the tolerant genotype (cv. Basilisk) after 8h and 24h. The OsALS1 homologue gene also had its expression increased in the two genotypes, but it was much more expressed in the sensitive genotype (D24/27 sexual artificially tetraploid) after8h and 24h. This could mean that more Al penetrates the symplast of the sensitive genotype which activates the OsALS1 gene. The amount of MS expressed in the tolerant genotype can suggest that it is more effective in preventing Al from entering the symplast.

Corresponding author: Lucimara Chiari, lucimara.chiari@embrapa.br