

TRANSCRIPTIONAL REGULATION IN SUGARCANE UNDER WATER DEFICIT DURING FORMATIVE GROWTH STAGE

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Present study was intended to examine the comparative transcript profile of six drought-responsive genes under water deficit conditions in sugarcane. Two tolerant genotypes of sugarcane Co 98014 and Co 0118 and two sensitive genotypes CoJ 85 and Co 89003 have had the contrast response to water stress were planted in big plastic pots in a complete randomized design. Water deficit conditions were created by water withholding on 120th day. Soil moisture was measured by gravimetric method. The moisture content was observed 23.9, 18.1 and 5.9 % on 120th day, 135th and 150th day, respectively (0–20 cm soil depth). The third upper expanded leaf was randomly collected as sample of all three stages. Using quantitative PCR analysis change in mRNA transcript was calculated and the level of mRNA transcript was remarkably increased for SOD and DroPro gene in tolerant than sensitive genotypes on 150th day whereas DREB and DNAj TFs was observed higher at 135th day as compared to irrigated condition (120th day). Ferredoxin-I and LEA gene transcripts were completely down regulated on 150th day. The fold change was comparatively more down regulated in the sensitive genotypes in compare to tolerant genotypes. The present study endorses the further exploration of these genes and its gene families for the future researchers.

Key words: Sugarcane; Water stress; Transcript expression; qPCR; Formative phase.

РЕГУЛЯЦІЯ ТРАНСКРИПЦІЇ У ЦУКРОВОЇ ТРОСТИНИ ЗА УМОВ ДЕФІЦИТУ ВОДИ ПРОТЯГОМ ЕТАПУ ФОРМОУТВОРЕННЯ

Метою цього дослідження було вивчити порівняльний профіль транскрипту шести посухочутливих генів цукрової тростини за умов нестачі води. Рослини

двох толерантних генотипів цукрової тростини Co 98014 і Co 0118 і двох чутливих генотипів CoJ 85 і Co 89003, які мали протилежну реакцію на дефіцит води, висадили у великі пластикові горщики за абсолютно рандомізованою системою. Умови дефіциту води були створені шляхом утримання вологи на 120-й день. Вологість ґрунту вимірювали за гравіметричним методом. Зареєстровані показники вмісту вологи становили 23,9, 18,1 і 5,9 % на 120-й, 135-й і 150-й день, відповідно (на глибині ґрунту 0–20 см). Третій верхній розпушений листок рандомізовано збирали в якості зразка на всіх трьох етапах. Зміну в транскрипті мРНК визначали за допомогою кількісного ПЛР аналізу. Рівень транскрипту мРНК був значно вищим для гену SOD і DroPro у рослин з толерантним генотипом, ніж у рослин з чутливим генотипом на 150-й день у той час, як транскрипційні фактори DREB і DNAj були вищими на 135-й день порівняно з умовами зрошення (120-й день). Транскрипти ферредоксину-I і гену LEA були повністю пригнічені на 150-й день. Кратність резистентності була порівняно нижчою у чутливих генотипів, ніж у толерантних генотипів. Це дослідження підтверджує доцільність подальшого вивчення цих генів і сімейств генів.

Ключові слова: цукрова тростина, дефіцит води, експресія транскрипту, кількісна ПЛР, фаза формоутворення.

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