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Transcriptional analysis of trehalose-6-phosphate synthetase and major chaperone genes in *Mesorhizobium ciceri* strain Ca181 to desiccation induced stress

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The persistence and growth of mesorhizobia in soils are negatively impacted by desiccation conditions. Studies were conducted to elucidate the nature of drought tolerance in the bacterium *Mesorhizobium ciceri* strain Ca181 and to correlate with symbiotic effectiveness. In this study, we used transcriptional analyses of trehalose-6-phosphate synthetase (TPS), *glgX, NodC* and major chaperone genes (*groESL, dnaKJ*) to obtain a comprehensive sympathetic of the response of *Mesorhizobium ciceri* strain Ca181 against drought. Polyethylene glycol used to generate drought stress and strain Ca181 tolerated YEB containing 45% PEG-6000 (PEG; wt/vol) for up to 5 days of incubation at 26°C. Desiccation of cells resulted in the differential expression of these genes, with considerable differentiation of 5 min, 15 min 30 min, 1 hr, 4 hr, 8 hr, 24 hr and 48 hr expressed genes. Upon drought conditions, Ca181 showed variable expression pattern of the trehalose-6-phosphate synthetase (TPS), *glgX, NodC* and major chaperone genes (*groESL, dnaKJ*) with relation to time interval. This is the first report on transcriptional analysis of the trehalose-6-phosphate synthetase (TPS), *glgX, NodC* and major chaperones genes in *Mesorhizobium ciceri* strain Ca181 under drought conditions, which may contribute to a better understanding the mechanisms of drought tolerance in mesorhizobia.

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