

Fructan metabolism is involved in drought tolerance in *Vernonia herbacea*: the effect of different watering frequencies.

Garcia, P.A.M.; Figueiredo-Ribeiro, R.C.L.; Silva, E.A.; Carvalho, M.A.M.
Seção de Fisiologia e Bioquímica de Plantas, Instituto de Botânica,
São Paulo, Brazil

Lack of water has been the major selective force in the evolution of plants and the ability to endure water deficit is an important determinant in the distribution of plants. Fructans are fructose-based oligo- and polysaccharides located in the vacuoles that function mainly as reserve carbohydrates in 15% of the angiosperms. Fructans are also thought to play a significant role in drought and cold tolerance. Because these compounds are soluble, they might act towards osmotic adjustment of cells by varying the degree of polymerization of the fructan pool. Fructans of the inulin type are the main reserve carbohydrates present in Asteraceae species from the Brazilian cerrado, including *Vernonia herbacea* (Vell.) Rusby, which accumulates about 80% of inulin in the underground organs (rhizophores). The aim of this work was to analyze fructan composition and metabolism in plants submitted to different watering frequencies (daily watering – control and watering every 7, 14 and 28 days). Samples were taken at the beginning of the experiment and after 28 and 56 days. After 28 days plants kept under different watering frequencies showed a decrease in photosynthesis rates and water potential (Ψ_w), despite of turgor maintenance. However after 56 days control and treated plants presented similar values for most analyzed parameters suggesting plant acclimation to water deficit. Additionally, treated plants presented a higher ratio oligosaccharides:polysaccharides, supporting the hypothesis that short chain fructans act in Ψ_w reduction and in turgor maintenance, leading to plant acclimation.

Key words: fructans, osmotic adjustment, water deficit.

Supported by FAPESP and CNPq