Differential performance of two forage species, Medicago truncatula and Sulla carnosa, under water-deficit stress and recovery

Titre	Differential performance of two forage species, Medicago truncatula and Sulla carnosa, under water-deficit stress and recovery
Type de publication	Article de revue
Auteur	Rouached, Aida [1], Slama, Inès [2], Zorrig, Walid [3], Jdey, Asma [4], Cukier, Caroline [5], Rabhi, Mokded [6], Talbi, Ons [7], Limami, Anis M. [8], Abdelly, Chedly [9]
Editeur	CSIRO Publishing
Type	Article scientifique dans une revue à comité de lecture
Année	2013
Langue	Anglais
Date	2013
Numéro	3
Pagination	254-264
Volume	64
Titre de la revue	Crop and Pasture Science
ISSN	1836-0947
Mots-clés	legume species [10], osmolytes [11], rehydration [12], Tolerance [13], water relations. [14]
Résumé en anglais	The response patterns during water deficit stress and subsequent recovery of two forage species, Medicago truncatula and Sulla carnosa, were studied. After germination and pre-treatment, seedlings were individually cultivated for two months under two irrigation modes: 100% and 33% of field capacity. Measured parameters were plant growth, water relations, leaf osmotic potential, lipid peroxidation, and leaf inorganic (Na+ and K+) and organic (proline and soluble sugars) solute contents, as well as delta-1-pyrroline-5-carboxylate synthase (P5CS) and proline dehydrogenase (PDH) activities. Our results showed that under control conditions, and in contrast to roots, no significant differences were observed in shoot biomass production between the two species. However, when subjected to water-deficit stress, M. truncatula appeared to be more tolerant than S. carnosa (reduction by 50 and 70%, respectively). In the two studied species, water-deficit stress led to an increase in root/shoot ratio and leaf proline and soluble sugar contents, and a decrease in leaf osmotic potential. Enzymatic assay revealed that in the two species, P5CS activity was stimulated whereas that of PDH was inhibited under stress conditions. Despite greater accumulation of proline, sugar, and potassium in leaves of S. carnosa, M. truncatula was more tolerant to water deficit. This was essentially due to its capacity to control tissue hydration and water-use efficiency, in addition to its greater ability to protect membrane integrity. Following stress relief, M. truncatula and S. carnosa showed partial re-establishment of growth capacity.

URL de la notice	http://okina.univ-angers.fr/publications/ua7902 [15]
DOI	10.1071/CP13049 [16]
Lien vers le document	http://dx.doi.org/10.1071/CP13049 [16]

Liens
[1] http://okina.univ-angers.fr/publications?f[author]=12835
[2] http://okina.univ-angers.fr/publications?f[author]=12836
[3] http://okina.univ-angers.fr/publications?f[author]=12837
[4] http://okina.univ-angers.fr/publications?f[author]=12838
[5] http://okina.univ-angers.fr/c.cukier/publications
[6] http://okina.univ-angers.fr/publications?f[author]=12839
[7] http://okina.univ-angers.fr/publications?f[author]=12840
[8] http://okina.univ-angers.fr/m.limami/publications
[9] http://okina.univ-angers.fr/publications?f[author]=12842
[10] http://okina.univ-angers.fr/publications?f[keyword]=12310
[11] http://okina.univ-angers.fr/publications?f[keyword]=12311
[12] http://okina.univ-angers.fr/publications?f[keyword]=5508
[13] http://okina.univ-angers.fr/publications?f[keyword]=7578
[14] http://okina.univ-angers.fr/publications?f[keyword]=12312
[15] http://okina.univ-angers.fr/publications/ua7902
[16] http://dx.doi.org/10.1071/CP13049