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SERIES A: Mediterranean Seminars
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New approaches for grassland research in a context of climate and socio-economic changes

Edited by:

Z. Acar, A. López-Francos, C. Porqueddu

Grassland-based systems are no longer seen exclusively as livestock production enterprises but as multiple use systems with important consequences for the global environment. They are crucial for the protection of ecosystem goods and services, for tourism and for mitigating climate change. Well-managed grasslands provide important benefits such as increased water infiltration and retention or improved nutrient cycling, associated with organic matter accumulation in the soil, as well as increased plant growth and species diversity. Thereby, grassland management is also an adaptation strategy for climate change, as it reduces the risks associated with prolonged drought periods and unreliable rains that characterise Mediterranean regions. There is an urgent need to assess the interaction between climate change and grasslands to identify appropriate options that can help farmers to manage forage resources under increasing drought conditions and market globalisation. The challenge is then to improve grassland productivity, pasture persistence and resilience under these constraints. Scientific advances in grassland management and new strategies in plant improvement may undoubtedly contribute to this aim.

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Fodder trees and shrubs in range and farming systems in semi arid regions of Tunisia

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Abstract. Five cultivated shrub species endemic to the semi arid regions of Tunisia, *Acacia fimbriata*, *Allocauarina verticillata*, *Medicago arborea*, *Anthyllis barba-jovis* L and *Opuntia ficus-indica*, were studied as a source of animal forage. The experiment was carried out in an experimental land in Mograne (Zaghouan, East central Tunisia). Plants were on average 4 years old conducted without irrigation. Sampling was made at the end of autumn (November) 2008. By the exception of *O. ficus-indica* all studied species had high crude protein content (>15%). *An. barba-jovis* followed by *M. arborea* had the highest N contents (>22%). Cultivated *Al. verticillata* had the highest ADF and ADL contents, 50% and 32.8%, respectively. By the exception of *A. verticillata* and *A. barba-jovis*, *in vitro* dry matter digestibility (IVD) was higher (>80%). It was concluded that some of these cultivated shrub species is compared with some leguminous forages and convenient even in dairy farms as a source of nitrogen. Moreover, the choice of alternate feed resource should not be restrictive but must fit within the existing farming systems, and be adapted to the economic realities of the farmer.

Key words. Browse – Nutritive value – Digestibility – Farming system.

Les arbustes fourragers dans les systèmes de production en zones arides et semi-arides de la Tunisie

Résumé. Cinq arbustes fourragers endémiques aux régions semi-arides de la Tunisie, nommées *Acacia fimbriata*, *Allocauarina verticillata*, *Medicago arborea*, *Anthyllis barba-jovis* L et *Opuntia ficus-indica*, ont été étudiées pour leurs valeurs nutritionnelles. Ces espèces sont cultivées dans l'exploitation de l'Ecole Supérieure d'Agriculture de Mograne (Zaghouan, centre est de Tunisie). Les plantes étaient âgées de 4 ans conduites à sec. L'échantillonnage des feuilles des différents arbustes thème de notre étude a été effectué à la fin de l'automne (Novembre) 2008. A l'exception de *O. ficus-indica* toutes les espèces étudiées ont présenté des teneurs élevées en protéines brutes (>15%) dont les feuilles de *An. barba-jovis* suivie par *M. arborea* ont les teneurs les plus élevées (>22%). Cependant les teneurs les plus élevées en ADF (50%) et ADL (32,8%) étaient observées au niveau des feuilles de *Al. verticillata*. A l'exception de *Al. verticillata* et *An. barba-jovis*, la digestibilité *in vitro* de matière sèche (IVD) était très élevée (> 80%). Il a été conclu que la valeur nutritionnelle de certaines espèces arbustives cultivées est comparée avec celle des légumineuses fourragères ce qui pourrait justifier son intégration dans les fermes laitières comme source d'azote pour les bétails. En outre, le choix de la ressource alimentaire à intégrer ne doit pas être restrictif, mais doit s'inscrire dans les systèmes agricoles existants, et être adaptées aux réalités économiques de l'agriculteur.

Mots-clés. Arbuste – Valeur nutritionnelle – Digestibilité – Système d'élevage.

I – Introduction

In Tunisia, rangelands represent one-third of the total land (5,413,000 ha) widespread mainly in the arid and semi-arid regions and distributed in forest and forest pasture (970,000 ha), *Stipa tenacissima*-based steppe (743,000 ha), communal and state rangelands (2,500,000 ha), and private rangelands (1,200,000 ha). In these areas, a major constraint to livestock production is