



# BOOK OF ABSTRACTS

First Legume Society Conference  
*2013: A Legume Odyssey*

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First Legume Society Conference  
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# Book of Abstracts

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International Legume Society  
Institute of Field and Vegetable Crops, Novi Sad, Serbia  
2013

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Getting the message out: grow, use, feed and eat legumes

### **Stereological analysis of *Medicago truncatula* Gaertn. stem as a pre-breeding technique to improve digestibility**

Lana Zoric<sup>1</sup>, Aleksandar Mikić<sup>2</sup>, Jadranka Luković<sup>1</sup>, Branko Čupina<sup>3</sup>, Đorđe Krstić<sup>3</sup>

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Structural characteristics of stem, especially the proportion of lignified tissues, have a strong impact on digestibility in many legume species. Anatomical analysis of stem of *M. truncatula* cultivars was performed using stereological method in order to examine genotypic variability in histological parameters that affect digestibility and assess tissue proportions along the stem maturity gradient. Lignification was first recorded in primary xylem walls. Volume densities ( $V_v$ ) of phloem and xylem increased linearly from the top to the bottom of the stems. Lignification of parenchyma pith cells occurred simultaneously with intensive xylem development. On the contrary, the proportions of epidermis, mechanical and parenchyma tissue significantly decreased along the stem. Lignified secondary xylem was the tissue with the highest  $V_v$  and estimated as the one with the highest potential impact on digestibility. Therefore, the improvement of digestibility could be achieved through the reduction of its proportion. Analyzed parameters showed high among-cultivar variability, which could be useful as a starting point in breeding for improved digestibility. The most favorable ratio of lignified and non-lignified tissues was recorded in Mogul and Jemalong cultivars. Borung and Jemalong were the cultivars with the largest stem cells, which are easier to digest and contain higher amounts of cell solubles. *M. truncatula* cultivars had more favorable percentages of thick-walled cells in stems, compared to *M. sativa*. Stereological method proved to be useful as a pre-breeding technique in the process of the biological evaluation of forage cultivars and an improvement of their digestibility.

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In the rich world of global agriculture, diverse legumes can play key roles to develop environment-friendly production, supplying humans and animals with the products of high nutritional value.

The Legume Society was initiated in 2011 with two primary missions. One of them was to treasure the rich legume research tradition of the European Association for Grain Legume Research (AEP), with emphasis on carrying out its the triennial legume-devoted conferences. Another one is to fulfill a long-term strategy of linking together the research on all legumes worldwide, from grain and forage legumes pharmaceutical and ornamental ones and from the Old World to the Americas.

We do anticipate that the First Legume Society Conference will be a unique and genuine contribution to our common goals: to promote the legume research and all its benefits into all spheres of the society, linking science with stakeholders and decision-makers, and to demonstrate how an efficient, useful and firm network of the legume researchers of the world is possible and sustainable.

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