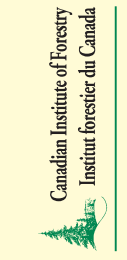
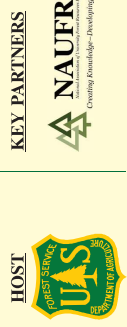
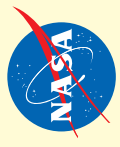


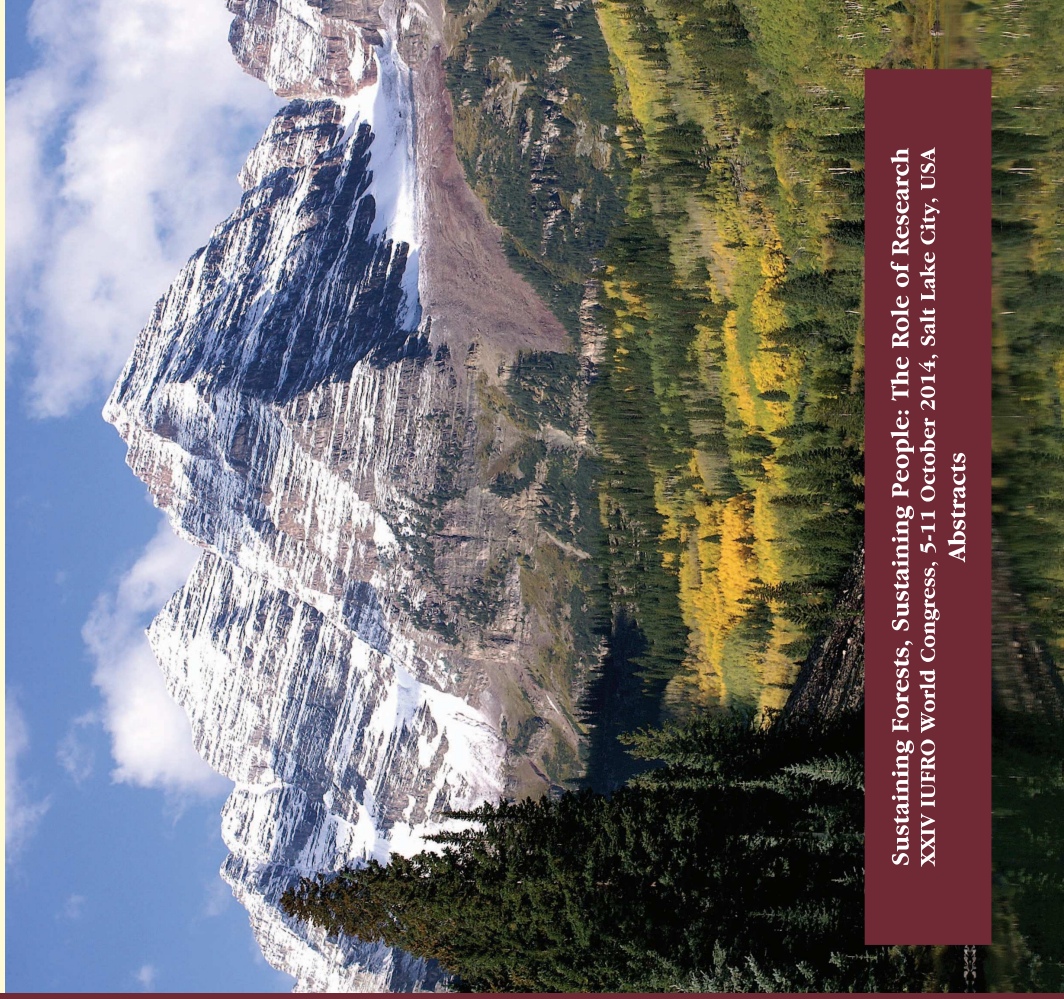
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Sustaining Forests, Sustaining People: The Role of Research
 XXIV IUFRO World Congress, 5-11 October 2014, Salt Lake City, USA
Abstracts

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**Sustaining Forests, Sustaining People:
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Abstracts

EDITORS

**JOHN A. PARROTTA, CYNTHIA F. MOSER, AMY J. SCHERZER,
NANCY E. KOERTH and DARYL R. LEDERLE**

long-term monitoring results of seven domestic hybrid poplar clones from China and seven exotic hybrid poplar clones introduced from the United States and Europe are presented. Comprehensive analysis results of long-term monitoring measurement show that Hanan, Beikang, 110, DN-34 clones have a high early survival rate, height and DBH. These characteristics when continuously expressed for a long period are considered to be appropriate for poplar clones to combat the desertification in Inner Mongolia, China. Therefore, for poplar afforestation to combat desertification in Inner Mongolia, China, Hanan, Beikang, and 110 domestic hybrid poplar clones from China and the DN-34 clone which is a D×N exotic hybrid poplar clone introduced from the United States and Europe are considered to be appropriate.

454 sequencing to assess the differential expression of genes due to ozone stress in *Viburnum lantana* L. Cristofori, A., La Porta, N., Sablok, G. (*Edmund Mach Foundation, Italy; nicola.laporta@fmach.it; sablogk@gmail.com*), Pellegrini, E. (*University of Pisa, Italy; elisa.pellegrini@for.unipi.it*), Baldi, P. (*Edmund Mach Foundation, Italy; paolo.baldi@fmach.it*), Nali, C., Cristofolini, F., Gottardini, E.

Individuals of the shrub species *Viburnum lantana* L. (wayfaring tree) treated with ozone (60 ppb for 45 days for 5 hours per day) or maintained in filtered air (control) were analyzed through suppression subtractive hybridization (SSH) in order to assess the main differences of induced (I) and repressed (R) libraries, representing the response of plants at a biological, cellular, and molecular level. Biomolecular procedures consisted of: RNA extraction, PCR select (SSH), and 454 cDNA library sequencing. A total of 38 800 and 12 495 high quality reads were assembled (Newbler and CAP3 softwares) after filtering for the induced and repressed libraries, resulting in a total of 543 and 705 UniGenes, respectively. Functional annotation and gene ontology assignment were used to define the different relevance of gene ontology (GO) categories in the libraries. Results showed an enrichment of GO categories involved in the defense to oxidative stress for the induced library, with an increase in glutathione (GSH), thioredoxin-1 (Trx1), and heat shock proteins (HSP). On the contrary, the GO categories involved in carbon utilization and photosynthesis (light harvesting complexes) were repressed in ozone exposed plants of *V. Lantana*.

Evaluating the water use efficiency of selected plantation species in the Philippines. Combalicer, M. (*University of the Philippines Los Baños, Philippines; msc1330@gmail.com*), Lee, D. (*Seoul National University, Korea, Republic of; leedk@snu.ac.kr*).

Water use efficiency (WUE) is commonly used as a selection criterion to improve yield in a dry environment where water is a limiting factor. The study aimed to evaluate the WUE of different plantation and reforestation species in the Philippines. The WUE of *Acacia auriculiformis*, *Acacia mangium* and *Pterocarpus indicus* was determined from 2-year-old, 10-year-old, and 20-year-old age classes. Parameters obtained were stomata size and number, net photosynthesis (P_N), transpiration rate (E), and stomatal conductance (g_s), each of which were observed in the lower, middle, and upper portions of the forest canopy. Results showed that significant differences in P_N , g_s , and WUE were observed and were higher in 20-year-old *A. mangium* and *A. auriculiformis*. Consequently, *Acacia auriculiformis* and *A. mangium* showed better ecophysiological attributes which are important features of species for rehabilitating degraded areas of the country. These species could serve as nurse species for other native species that would eventually lead to successful forest succession in the future.

Genetic characterization of marginal pedunculate oak populations adapted to xeric conditions: implications for conservation and sustainable management. Curtu, A., Sofletea, N. (*University of Transilvania, Romania; lucian.curtu@unitbv.ro; nic.sofletea@unitbv.ro*), Finkeldey, R. (*Georg-August-University Göttingen, Germany; Reiner.Finkeldey@zvw.uni-goettingen.de*).

Over the last two decades, the average temperature has increased by 0.9 °C in southeastern Romania and will continue to rise under most climate change scenarios. The steppe bioclimatic region which is confined to this territory is supposed to enlarge, and the pedunculate oak (*Quercus robur*) populations situated at its margins will be exposed to drier environmental conditions. Here we address the question of genetic differentiation between marginal populations of pedunculate oak (known as *Q. pedunculiflora* and situated in the vicinity of the steppe), and core populations of pedunculate oak. Even though the two groups of populations can be distinguished in terms of pubescence on the abaxial leaf surface, little is known about the genetic differences between them. We sampled three pairs of populations along southeastern Romania and tested both genomic and EST-SSR markers. We found strong support for two genetic clusters that correspond to marginal and core populations, respectively. Based on our set of microsatellite markers, we are now able to characterize *Q. pedunculiflora* populations to determine the degree of admixture and to test the purity of seed lots. Our results suggested that genetics can have a significant impact on conservation of oak resources and their sustainable management.

Promoting heartwood formation of young trees of *Santalum album* by plant growth regulators. Daping, X. (*Chinese Academy of Forestry, China; gzfsrd@163.com*).

Sandalwood (*Santalum album*), one of the most valuable tree species cultivated in large areas in southern China in recently years, is renowned for its aromatic heartwood which contains fragrant essential oil. Generally, sandalwood takes from 10–13 years or longer to form fragrant heartwood. Therefore, accelerating heartwood formation in young sandalwood is one of the most urgent issues in sandalwood plantations. In this paper, we evaluated the influences of five plant growth regulators (PGRs), including abscisic acid, benzyladenine, ethrel, jasmonic acid, and methyl viologen, on growth, heartwood formation, as well as essential oil composition of 6-year-old sandalwood through a stem injection method. The results indicated that all the above PGRs treatments can induce young sandalwood to form aromatic heartwood, but no significant differences were found in height and DBH growth, but obvious different were observed in oil content and quality. Stem injection of 0.6% benzyladenine got the highest oil content in the induced heartwood among all the treatments (9.34% in average), while treatment with 0.15% methyl viologen got the least oil content (2.54% in average). Oil quality induced by benzyladenine was higher than the ISO standard for *S. album* oil regardless of the injection concentration and dosage. That may imply that benzyladenine plays an important role in the induction of heartwood formation in sandalwood.