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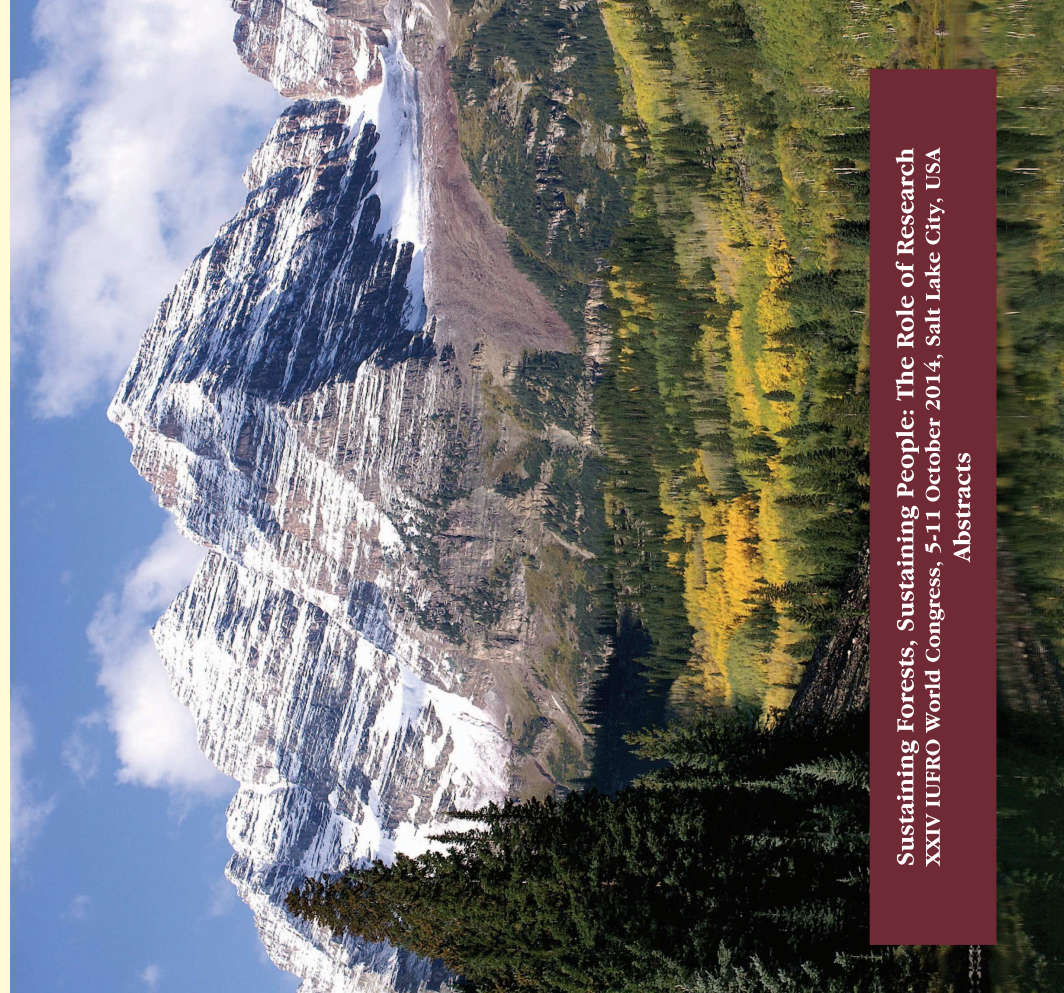

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# The International Forestry Review



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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# The International Forestry Review

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# *The International Forestry Review*



## **Sustaining Forests, Sustaining People: The Role of Research**

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### **Abstracts**

#### **EDITORS**

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

**454 pyrosequencing analyses of mountain forest soils reveal a high fungal diversity and a rapid response to successional stages.** La Porta, N. (European Forest Institute and Edmund Mach Foundation, Italy; nicola.laporta@fmach.it), Sablok, G., Pindo, M. (Edmund Mach Foundation, Italy; gaurav.sablok@fmach.it; massimo.pindo@fmach.it), Squartini, A. (University of Padova, Italy; andrea.squartini@fmach.it).

A broad range fungal metagenomics study, using a Roche 454 pyrosequencing platform, was undertaken targeting internal transcribed spacer (ITS) fungal amplicons from six Norway spruce (*Picea abies*) forest soils in the northeastern Italian Alps. In our study, several stands having different bedrock composition (acid, basic, and intermediate) types, facing northern or southern slope exposure, and being in one of four stand age classes such as: gap, innovation, aggradation, and biostatic were investigated to examine the effect of these factors and their combinations on the associated fungal communities. The aim of the project was to assess the overall fungal diversity across a range of different conditions and to rank the shaping forces of different environmental factors over soil fungal community composition. In particular, the analysis determined the extent of conserved taxa and their site specificities across a given geographic range and through a gradient of environmental conditions. More than 330 fungal taxa were identified. Results indicated patterns highly guided by pH as shown by a highly diverse community of acid/north spruce forest in which evenness was higher and successional stages were less evident and did not lead to emerging dominances at mature stages as instead occurred in each of the south-facing forests.

**Effects of stand structure regulation on soil labile organic carbon under *Pinus elliottii* plantations.** Liu, Y., Tan, G., Li, X., Huo, B., He, M. (Jiangxi Agricultural University, China; liuyq404@163.com; tgx98101225@163.com; 908319985@qq.com; 540418011@qq.com; 274264518@qq.com).

This study was conducted in Taihe County, a degraded red soil region in Jiangxi Province. We focused on how plantation type and stand structure affected the contents of soil labile organic carbon (SLOC), by comparing the contents of SLOC analyzed under pure forest of *Pinus elliottii* (I), pure forest of *Pinus massoniana* (II), mixed forest of *P. elliottii*-*L. formosana* (III), and pure forest of *Liquidambar formosana* (IV). The ranges of the content of dissolved organic carbon (DOC), readily oxidizable organic carbon (ROC), and microbial biomass carbon (MBC) were 52.67–105.17, 6.68–13.33, and 57.70–154.21 mg/kg, respectively. DOC decreased in the following order: IV > III > II ≈ I. The decreasing order of MBC and ROC was IV ≈ III > II ≈ I. The soil DOC, ROC, and MBC significantly increased after structure adjustment in the sixth and ninth years with thinning and planting of broadleaf on the *P. elliottii* plantation compared with the pure *Pinus elliottii* plantation. The results suggest that transformation of conifer monocultures into mixed conifer-broadleaved plantations is an effective means to improve the ecological function of artificial pure coniferous forest.

**Different allocation patterns of 18 chemical elements in leaves, branches, and different root branch orders across 18 species in the Gurbantünggüt Desert in China.** Ma, Z., Guo, D. (Chinese Academy of Sciences, China; mazeqing@gmail.com; guodl@igsnr.ac.cn).

Plant chemical traits play a vital role in plant functioning, such as growth and defense, and are tightly related to carbon and nutrient cycling in ecosystems. However, little is known about how different chemical traits are allocated across different plant organs. Here, we examined plant organ-chemical traits relationships by analyzing 18 chemical traits (C, N, P, K, Mg, Ca, etc.) in leaves, branches, and different orders of roots across 18 species of different life forms (including spring ephemerals, herbs, shrubs, and trees) in the Gurbantünggüt Desert. We found that plant chemical traits, including plant essential mineral elements (e.g., N, P) and soil-derived metals (e.g., Fe, Al, Pb) showed different allocation patterns in leaves, branches, and different orders of roots across 18 species. Tissue N and P were highest in the distal organs such as leaves and first order roots, but tissue Fe, Al, and Pb were concentrated in roots and diluted in leaves. Plants accumulated some elements in leaves and others in roots. Moreover, these patterns differed systematically between ephemerals, herbs, and trees. These findings suggest that roots play an important role in filtering and selecting nutrients from soil, and different life forms differ in predictable manners in the filtering process.

**Fine root turnover within land-use change from primary forest to degraded forest and oil palm plantation on tropical peat.** Persch, S., Hergoualc'h, K., Verchot, L. (Center for International Forestry Research, Indonesia; s.persch@cgiar.org; k.hergoualc'h@cgiar.org; l.verchot@cgiar.org), Hoelscher, D. (University of Goettingen, Germany; d.hoelsch@gwdg.de), Dawson, L. (James Hutton Institute, UK; lorna.dawson@hutton.ac.uk), Jourdan, C. (CIRAD, France; christophe.jourdan@cirad.fr).

Root turnover is a crucial component of ecosystem and nutrient cycling. However, our current knowledge and understanding is still very limited, especially in regard to tropical forests, which are degraded and deforested at an increasing rate. Among the most vulnerable forest ecosystems to land-use change in the tropics are peat swamp forests. We studied root turnover on tropical peat in Jambi, Sumatra, from October 2012 to September 2013 in a land-use trajectory from primary peat swamp forest (PF) to degraded forest (DF) and oil palm plantation (OP). We used the sequential coring technique, ingrowth nets, and minirhizotrons to estimate root turnover rates. Preliminary results from the sequential coring with the min-max approach suggested that the root turnover rates differed ( $0.82 \pm 0.07/\text{year}$ ,  $1.32 \pm 0.37/\text{year}$ , and  $1.01 \pm 0.14/\text{year}$ , for the PF, DF, and OP, respectively). These preliminary results indicate that the change of land use from waterlogged conditions to drained soil has an effect on root turnover and carbon input into the soil.

**Lateral root distribution of *Eucalyptus camaldulensis* and *Eucalyptus pellita* under different tree spatial arrangements.** Reis, G., Ferreira Reis, M. (Universidade Federal de Viçosa, Brazil; greis@ufv.br; mgfreis@ufv.br), Contreras-Marquez, C. (Universidad Centroccidental Lisandro Alvarado, Venezuela; carloscontreras@ucla.edu.ve), Faria, R., Lopes, E., Baiero, D. (Universidade Federal de Viçosa, Brazil; ronan.faria@ufv.br; emerson.lopes@ufv.br; diogo.baiero@ufv.br).

Eucalypt has been planted in Brazil in low tree density stands to produce large diameter logs in consortium with crop or pasture. Tree root distribution is an important variable to be considered in agroforestry systems. Lateral roots were excavated to a depth of 40 cm in  $0.5 \text{ m} \times 0.5 \text{ m}$  sampling units distributed systematically in one quarter of the area occupied by each tree, in 7-year-old