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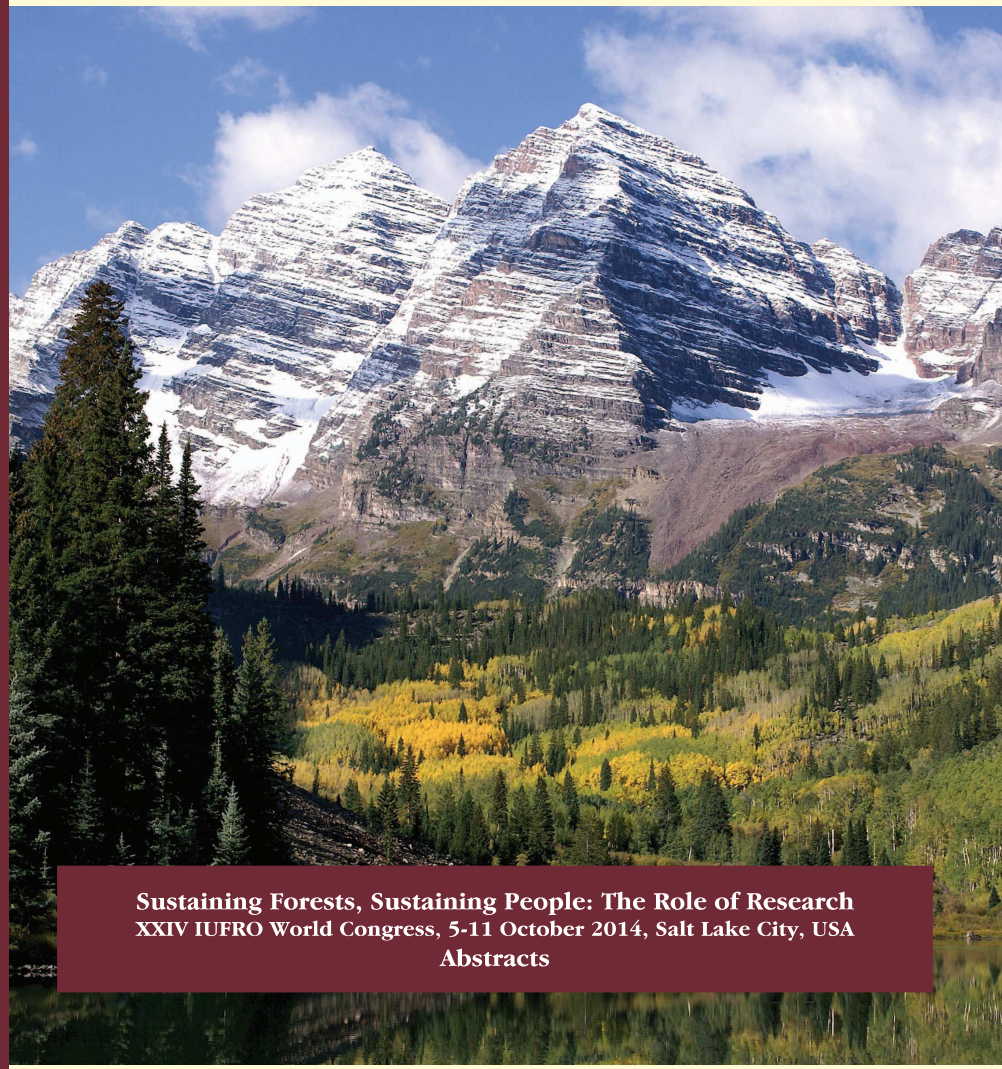

Sustaining Forests, Sustaining People: The Role of Research
XXIV IUFRO World Congress, 5-11 October 2014, Salt Lake City, USA
Abstracts

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

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A.A. NAWIR and L. SANTOSO

Center for International Forestry Research, Jl. CIFOR, Situ Gede, Sindang Barang, Bogor 16680, Indonesia

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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

South Africa *P. nemorensis* was first detected in 1942 on pine trees in the Port Elizabeth area. It has subsequently spread throughout the major pine-growing regions of the country and occurs on all commercially grown pine species, most likely because of the widespread movement of timber throughout the country and the capacity of the weevil to fly long distances. In this study the authors ask whether the current populations of *P. nemorensis* in South Africa are the result of a single or multiple introductions. These scenarios are expected to lead to different patterns of population genetic diversity, and might even have resulted in the introduction of cryptic species. To address these questions, cytochrome oxidase I (CO-I) gene sequence data and microsatellite markers are being used to characterize the genetic diversity of *P. nemorensis* samples collected across the major pine-growing regions in South Africa. The data collected during this study are important to consider when attempting to improve management of this pest.

Advances in the knowledge of *Eucalyptus* gall insects in Uruguay: current status and future prospects. Jorge, C. (*Universidad de la Republica, Uruguay; carolina.jorge@cut.edu.uy*), Gómez, D., Martinez, G. (*Instituto Nacional de Investigación Agropecuaria (INIA), Uruguay; dgomez@tb.inia.org.uy; gmartinez@tb.inia.org.uy*), Reyna, R. (*UPM-Forestal Oriental, Uruguay; rossana.reyna@upm.com*).

Uruguay has 1 million ha forested with exotic species, and 75% of this area is in *Eucalyptus* plantations. A national silvicultural practice characterized by large-scale plantations with monocultural stands makes it mandatory to carry out phytosanitary surveillance to prevent the entrance of new pests. A significant increase in insect invasions on *Eucalyptus* production areas has been observed in recent years. Gall-forming insects cause concern because of the risk they pose to young plantations. *Leptocybe invasa* Fisher & La Salle (Hymenoptera: Eulophidae) is considered one of the most invasive species reported in *Eucalyptus*. It colonized the region in 2008 when it was found in Brazil. It was officially reported in Uruguay in 2013. Although no economic losses have been recorded in Uruguay to date, it is considered a serious problem in Brazil and Argentina. Current studies on gall-forming insects in *Eucalyptus* are scarce in Uruguay. In order to develop management strategies for this species and others in this guild, a national survey has been implemented, and studies on bioecology and species distribution are ongoing.

Siberian pine mortality in the Southern Siberian Mountains. Kharuk, V. (*Sukachev Institute of Forest, Russian Federation; kharuk@ksc.krasn.ru*).

The causes and spatial patterns of Siberian pine mortality were analyzed based on satellite and dendrochronology data. Climate variables studied included temperature, precipitation, and drought index. Stand mortality was first detected in the year 2006 at an elevation of 650 m, and extended up to 900 m by the year 2012. The area of dead stands and the upper mortality line were correlated with increased drought. The uphill margin of mortality was limited by elevational precipitation gradients. Greatest mortality occurred on southern slopes within a 10–30° slope range and on convex terrain. Tree radial increment was correlated with drought index ($r^2 = 0.37$). The results showed the primary role of drought stress on stand mortality. A secondary role was played by bark beetles and root fungi attacks. The observed Siberian pine mortality is part of a broader phenomenon of "dark needle conifer" (DNC: Siberian pine, fir, and spruce) decline in European Russia, Siberia, the Russian Far East, and Belorussia. In addition, birch mortality was documented in the Trans-Baikal area. All locations of stand mortality coincided with areas of observed increases in drought. With increased aridity, DNC within the southern part of its range may be replaced by drought-resistant *Pinus silvestris* and *Larix sibirica*.

Heavy economic damage due to rot pathogen *Heterobasidion annosum s.l.* in close-to-nature managed Norway spruce forests in the Italian Alps. La Porta, N. (*Edmund Mach Foundation (MOUNTFOR), Italy; nicola.laporta@fmach.it*), Battistel, G., Gori, Y. (*Edmund Mach Foundation (FEM-IASMA); gianantonio.battistel@fmach.it; yuri.gori@fmach.it*).

Root and butt rot pathogens are important fungi that affect the forest carbon sequestration by destroying the root and stem wood of forest trees, by predisposing the forest to windfalls, and by limiting tree growth. *Heterobasidion annosum sensu lato* is the main pathogen affecting conifers in the Northern Hemisphere. The incidence of natural infection of *Heterobasidion* spp. and economic damage were recorded in Norway spruce (*Picea abies*) forests in the Central-Eastern Italian Alps. About 1 900 trees were sampled from 63 transects in pure stands of Norway spruce or mixed stands dominated by Norway spruce. Results showed that the pathogen was present in most of the transects, though with different incidence. All three species of *Heterobasidion* were found in the study, but only one or two species were found in any given transect. The percentage of trees infected in each transect differed remarkably, ranging from 39 to 100%. The average percentage of infected stump surface differed between transects, ranging from about 10 to 49%. This study shows the recurrent and heavy presence of *H. annosum* in Alpine forests and the surprisingly heavy damage caused by this fungus. The ecological role of this pathogen and its economic impact are discussed.

***Cephalcia arvensis* defoliation on Norway spruce: a case study analysis by tree-rings and stable isotopes approach.** La Porta, N. (*Edmund Mach Foundation (MOUNTFOR), Italy; nicola.laporta@fmach.it*), Gori, Y., Camin, F (*Edmund Mach Foundation (FEM-IASMA), Italy; yuri.gori@fmach.it; federica.camin@fmach.it*), Carrer, M. (*University of Padova, Italy; marco.carrer@unipd.it*), Battisti, A. (*University of Padova, Italy; andrea.battisti@unipd.it*).

This paper focuses on carbon and oxygen stable isotopes in conjunction with tree-ring chronologies to investigate the short- and long-term effects of *Cephalcia arvensis* defoliation on *Picea abies*. The authors found massive growth loss and significantly different carbon and oxygen stable isotope patterns associated with insect feeding; while carbon isotope values increased, oxygen isotope values decreased in the defoliated trees. Depletion of $\delta^{18}O$ reached its peak of –22.8‰ (1989), coinciding with the year of highest growth loss. The values in defoliated trees were close to those in control trees (1990), 2 years before complete growth recovery (1992). The depletion of $\delta^{18}O$ started 1 year ahead of growth reduction, whereas ^{18}O enrichment started 1 year before growth recovery. The authors hypothesized that a period of severe drought in the outbreak area before the insect attack may have caused the trees to mobilise reserve starch, which made trees more susceptible to *Cephalcia* attack as a result of increased soluble sugars and aminoacids concomitant with the direct effect of high temperature and dry weather on the insect populations. Moreover, the carbon and oxygen isotope patterns could be explained by both an increase in photosynthetic rate and a resort to starch reserves following insect feeding.