

**THE INTERNATIONAL RESEARCH GROUP ON WOOD PROTECTION**

# **The 37<sup>th</sup> Annual Meeting of IRG**

## **Scientific programme and Abstracts**

**IRG Secretariat  
SE-100 44 Stockholm  
Sweden  
[www.irg-wp.com](http://www.irg-wp.com)**

**THE INTERNATIONAL RESEARCH GROUP ON WOOD PROTECTION**

**The 37<sup>th</sup> Annual Meeting of IRG**

**Part 1  
Scientific Programme**

**IRG Secretariat  
SE-100 44 Stockholm  
Sweden  
[www.irg-wp.com](http://www.irg-wp.com)**

# MONDAY 19 JUNE

**Rica**

## **09.15-10.00 Keynote presentation**

**Chairman: Dr Gérard Deroubaix**

### **IRG/WP 06-20348**

How to win friends and influence the market - Service Life Prediction and performance-based durability assessments of wood products in construction  
F Englund

**Rica**

## **10.30-12.00**

### **Section 1 Biology, Main session**

**Chairman: Dr Frederick Green III**

**Vice-chairman: Dr Mark Mankowski (acting)**

### **IRG/WP 06-10588**

Isolation and characterization of hydroxyl-radical-producing glycopeptide genes from the white-rot basidiomycete *Phanerochaete chrysosporium*  
H Tanaka, G Yoshida, Y Baba, K Matsumura, S Itakura, A Enoki

### **IRG/WP 06-10579**

New Observations and Interpretation for Tunnelling Bacteria Decay  
R Wakeling

### **IRG/WP 06-10581**

Distribution and genetic variation of *Reticulitermes* (Isoptera: Rhinotermitidae) in Portugal  
T Nobre, L Nunes, P Eggleton, D E Bignell

### **IRG/WP 06-10594**

Natural durability of Norwegian wood species for above ground applications – Project presentation and preliminary results  
P O Flæte, G Alfredsen, Fred G Evans

# MONDAY 19 JUNE

Rica I	Rica II	Nord-Norge
<b>13.30-15.00</b>		
<b>WP 3.3 Preservative performance (lab tests)</b>	<b>WP 1.3 Bluestain and moulds</b>	<b>WP 1.7 Natural durability</b>
<b>Convener: Dr Radu Craciun</b>	<b>Convener: Dr Miha Humar</b>	<b>Convener: Dr Andrew H H Wong</b>
<p><b>IRG/WP 06-30410</b> Effect of fumigation with sulfuryl difluoride on wood inhabiting fungi, a laboratory test A Pfeffer, W Unger, G Fröba, G Binker</p> <p><b>IRG/WP 06-40329</b> Corrosiveness of metal by copper-based preservatives Ying Zhang, Mingliang Jiang</p> <p><b>IRG/WP 06-40342</b> Paintability and gluability of wood treated with arsenic-free and chromium-free preservative treatments L Podgorski, G Legrand</p>	<p><b>IRG/WP 06-10591</b> Quantification of methylene bis thiocyanate in wood and its effect on a sapstain fungus <i>Ophiostoma floccosum</i> T Singh</p> <p><b>IRG/WP 06-10595</b> Direct analysis from wood of the blue stain fungi <i>Aureobasidium pullulans</i> and <i>Hormonema dematioides</i> by denaturing gradient gel electrophoresis M J Ray, D J Dickinson</p> <p><b>IRG/WP 06-20329</b> Efficacies of an insecticide and a fungicide for preventing blue-stain of Japanese red pine logs H Taniuchi, T Koiwa, H Masuya, S Doi</p> <p><b>IRG/WP 06-10589</b> Blue Staining of Coated Modified and Unmodified Wood M Petrič, M Pavlič, M Humar, M Tomažič</p>	<p><b>IRG/WP 06-10571</b> On the changes of natural durability of wood sterilized by gamma radiation R Despot, M Hasan, M Glavaš, G Rep</p> <p><b>IRG/WP 06-10592</b> Comparative studies of natural durability of Japanese cedar (<i>Cryptomeria japonica</i> D. Don) among the geographic cultivates I Usta, K Takata, S Doi</p> <p><b>IRG/WP 06-10593</b> Molecular characterization of M'jej, decaying agent of cedar forests in Morocco A Zaremski, S Bakkali-Yakhlef, C Chaintreuil, Y Abbas, Y Prin, M Abourouh, M Ducousso</p> <p><b>IRG/WP 04-40331</b> (see also Section 4 main session) The Influence of Extractives on Western Redcedar's Equilibrium Moisture Content R Stirling, P I Morris</p>

# MONDAY 19 JUNE

<b>Rica I</b>	<b>Rica II</b>	<b>Nord-Norge</b>
<b>15.30-17.30</b>		
<b>WP 3.4 Preservative performance (field tests)</b>	<b>WP 5.1/5.2 Environmental management/risk assessment</b>	<b>WP 1.7 Natural durability, cont'd</b>
<b>Convener: Dr Lina Nunes</b>	<b>Convener: Dr Jenna Jambeck</b>	<b>Convener: Dr Andrew H H Wong</b>
<p><b>IRG/WP 06-30406</b> Performance of boron-treated radiata pine in above ground field tests in New Zealand M Hedley, D Page</p> <p><b>IRG/WP 06-30390</b> Performance of borate-treated lumber after 8 years in an above-ground termite field test in Hawaii J K Grace, A Byrne, P I Morris, K Tsunoda</p> <p><b>IRG/WP 06-30395</b> Performance of borate-treated lumber after 10 years in a protected, above-ground field test in Japan (Final report) K Tsunoda, A Byrne, P I Morris, J K Grace</p> <p><b>IRG/WP 06-40354</b> Resistance of DMDHEU-treated pine wood against termite and fungi attack in field testing according to EN 252. Results after 30 months S Schaffert, L Nunes, A Krause, H Militz</p> <p><b>IRG/WP 06-20343</b> Field Tests on Poles - A report from practice A Peylo, C G Bechgaard</p> <p><b>IRG/WP 06-30409</b> Long term marine performance of ACZA treated Hem fir in Krishnapatnam harbour, east coast of India B Tarakanadha, K S Rao, J J Morrell</p>	<p><b>IRG/WP 06-40343</b> Characteristics of treated oriented strand lumber using recycle chips T Shibusawa, A Miyatake, K Yamamoto, K Hashimoto, H Sonobe</p> <p><b>IRG/WP 06-50240</b> Laboratory Leaching Tests to Study the Effects of Post-Treatment Storage Periods on CCA Leachability and Fixation in Treated Permeable and Refractory Malaysian Hardwoods A H H Wong, H C Lai, N P T Lim</p> <p><b>IRG/WP 06-50239</b> Arsenic removal by plant pumping mechanism from arsenic solution using activated aluminum oxide as adsorbent – a preliminary study B Tarakanadha, H Koyanaka, T Hata, Y Imamura</p>	<p><b>IRG/WP 06-10598</b> The natural durability of wood in different use classes. Part II A O Rapp, U Augusta, K Brandt</p> <p><b>IRG/WP 06-20330</b> Predicting the decay resistance of timber above-ground: 1. Climate effects L P Francis, J Norton</p> <p><b>IRG/WP 06-10597</b> Resistance of pine and spruce heartwood against decay - The effect of wood chemical composition and coating with water-borne wood oil product H Viitanen, S Metsä-Kortelainen, T Laakso</p>

# TUESDAY 20 JUNE

**Rica**

**08.30-10.00**

## **Section 2 Test methodology and assessment, Main session**

**Chairman: Ms Isabelle Le Bayon**

**Vice-chairman: Dr Michael J Kennedy**

### **IRG/WP 06-20327**

Is Field Test Data from 20 x 20 mm Stakes Reliable? Effects of Decay Hazard, Decay Type and Preservative Depletion Hazard  
R Wakeling

### **IRG/WP 06-20344**

Measuring Soil Respiration as a New Approach to Describe the Interaction Between Wood (Treated and Untreated) and Microbiologically Active Soil  
I Stephan, W Mierke

### **IRG/WP 06-20349**

Qualitative and quantitative assessment of chemicals used for wood durability improvement by Near Infrared Spectroscopy  
S Zahri, F Charrier, H Baillères, B Charrier

### **IRG/WP 06-20323**

The potential for accelerated ageing to determine the persistence of active ingredients in timber  
L D A Saunders, M R Powell

# TUESDAY 20 JUNE

Rica

10.30-12.00

## Section 5 Environmental aspects, Main session

Chairman: Prof Dr D Pascal Kamdem

Vice-chairman: Dr Ed Baines

### IRG/WP 06-30402

Above and Below-Ground Depletion of Copper, Chromium and Arsenic from *Pinus radiata* and *Fagus sylvatica* at Thirteen Test Sites in New Zealand and Australia  
R Wakeling

### IRG/WP 06-30408

Addition of boron compounds and octanoic acid for improvement of biocidal properties and copper fixation at copper-ethanolamine based wood preservatives  
F Pohleven and M Humar

### IRG/WP 06-50238

Thermal decomposition behavior of CCA-treated wood for safe disposal and the safe recovery of heavy metals through pyrolysis  
Dong Won Son, Dong-heub Lee, Sun-hae Cheon, Myung Jae Lee

### IRG/WP 06-50242

A Prediction of Arsenic Groundwater Concentrations Influenced by Construction and Demolition Debris Landfills in Florida Containing CCA-Treated Wood  
J Jambeck, T Townsend, H Solo-Gabriele

# TUESDAY 20 JUNE

## Rica I

**13.30-15.00**

### Special session: Performance of treated wood composites

**Convener: Mr Paul Merrick**

#### Wood Panels

##### **IRG/WP 06-30400**

Exposure of CCA and ACZA treated parallel strand lumber to marine borer attack in Northeastern and Southeastern waters of the United States of America

B Goodell, P Merrick, J Jellison, Yuhui Qian

##### **IRG/WP 06-30407**

Performance of Preservative Treated Parallel Strand Lumber in Marine Exposures

J J Morrell, C S Love, P Merrick

##### **IRG/WP 06-30405**

Laboratory and field evaluation of imidacloprid and cypermethrin as glue-line treatments for softwood plywood

J W Creffield, D K Scown

#### Wood Polymer Composites

##### **IRG/WP 06-40351**

Wood-Plastic Composites and the Durability Dilemma: Observations from the Field

M J Manning, F M Ascherl, M E Mankowski

## Rica II

### WP 2.2 Microbiological test methodology

**Convener: Dr Shuichi Doi**

##### **IRG/WP 02-20341**

Testing durability of treated wood according to EN 252. Interpretation of data from Nordic test fields

M-L Edlund, F G Evans, K Henriksen, T Nilsson

##### **IRG/WP 02-20342**

L-joint based testing for service life prediction of exterior plywood in out of ground contact conditions

J De Smet, I De Windt, J Van Acker

##### **IRG/WP 06-20331**

EN 152: Is this Standard Relevant for today's Wood Preservatives? A Critical Review

B Jensen, F Imsgard, J Larsen

##### **IRG/WP 06-20332**

Effects of chlorothalonil (CTN) and butylated hydroxytoluene (BHT) on microbial communities involved in the deterioration of wood using T-RFLP I: Accelerated laboratory decay study

G T Kirker, M L Prewitt, S V Diehl

# TUESDAY 20 JUNE

Rica I	Rica II	Nord-Norge
<b>15.30-17.30</b>		
<b>Special session. Performance of treated wood composites, cont'd</b> <b>Convener: Mr Paul Merrick</b>	<b>WP 1.5/WP 2.5 Termites</b>  <b>Conveners: Prof Dr K Grace/Mr J Creffield</b>	<b>WP 3.2 New wood protecting chemicals</b>  <b>Convener: Dr Gry Alfredsen</b>
<p><b>IRG/WP 06-40338</b> Wood plastic composites from modified wood. Part 1. Conceptual idea, mechanical and physical properties P Larsson-Brelid, B K Segerholm, M Westin, M E P Wälinder</p> <p><b>IRG/WP 06-40353</b> Wood plastic composites from modified wood. Part 2. Durability in laboratory decay tests M Westin, P Larsson-Brelid, M-L Edlund, G Alfredsen</p> <p><b>IRG/WP 06-20340</b> Laboratory methods for assessing the resistance of wood plastic composites to fungal attack J J Morrell, A S Guzman</p> <p><b>IRG/WP 06-20345</b> Overview of European discussions on Standardisation and list of proposed standards for WPC performance qualification G Labat, M Vernois, T Gay</p> <p><b>IRG/WP 06-20347</b> Testing biological durability of wood-plastic composites J Van Acker</p>	<p><b>IRG/WP 06-20324</b> Borate Protection and Termites: Variation in Protection Thresholds Explained B C Peters, C J Fitzgerald</p> <p><b>IRG/WP 06-20325</b> Termite response to oil-heat-treated Norway spruce, Scots pine and Eucalyptus wood L Nunes, T Nobre, C Welzbacher, A O Rapp</p> <p><b>IRG/WP 06-20335</b> Re-sealing cut ends of envelope-treated softwood framing timber to protect against damage by the Australian subterranean termite <i>Coptotermes acinaciformis</i>: A revisitation B C Peters, M Lenz, J W Creffield</p> <p><b>IRG/WP 06-10601</b> Effects of Two Insect Growth Regulators (IGRs) on <i>Microcerotermes diversus</i> (Isoptera : Termitidae) in Southwest Iran B Habibpour, M S Mossadegh, G Henderson, S Moharramipour</p>	<p><b>IRG/WP 06-30399</b> Enhancing the Performance of Transparent Coatings by UV Protective Pre-treatments P I Morris, S McFarling</p> <p><b>IRG/WP 06-10600</b> Study of new wood preservatives from biological origin and low toxicity against wood decay organisms (fungi and termites) M T Troya, M J Prieto, F Rubio, D Lorenzo, J J Teixidó</p> <p><b>IRG/WP 06-10585</b> The bacterial transformation of organic biocides; a common mechanism? D F Wallace, D J Dickinson</p> <p><b>IRG/WP 06-30393</b> Biological resistance of didecyl dimethyl ammonium tetrafluoroborate (DBF)-treated wood in soil-bed and Basidiomycetes tests S N Kartal, C Brischke, A O Rapp, Y Imamura</p> <p><b>IRG/WP 06-30404</b> Moldicidal properties of seven essential oils V W Yang, C A Clausen</p>

# WEDNESDAY 21 JUNE

Rica

08.30-10.00

## Section 4 Processes and properties, Main session

Chairman: Dr Koichi Yamamoto

Vice chairman: Dr Andreas Rapp

### **IRG/WP 06-20346**

High-energy multiple impact (HEMI)-test – Part 1: A new tool for quality control of thermally modified timber  
C Brischke, A O Rapp, C R Welzbacher

### **IRG/WP 04-40331**

The Influence of Extractives on Western Redcedar's Equilibrium Moisture Content  
R Stirling, P I Morris

### **IRG/WP 06-40341**

The Effect of Flavonoids on Colour and Spectral Changes of the Wood Surface Caused by Heat Treatment or Ultra-violet Irradiation  
R Csonka-Rákosa, L Molnár-Hamvas, E Börcsök, J Molnár, K Németh

# WEDNESDAY 21 JUNE

**Rica**

**10.30-12.00**

## **Section 3 Wood protecting chemicals, Main session**

**Chairman: Dr Jeff Lloyd**

**Vice chairman: Prof Dr Marko Petrič**

### **IRG/WP 06-30397**

The role of chromium in wood preservatives - The situation and new results concerning biological efficacy

P Jüngel, E Melcher

### **IRG/WP 06-30401**

Investigation of new wood preservation formulations based on synergies between antioxidant, 2-HPNO and Propiconazole

B Bakhsous, S Dumarçay, E Gelhay, P Gérardin

### **IRG/WP 06-30412**

Surface and system treatments of wood for outdoor use

B Jacobsen, F G Evans

# THURSDAY 22 JUNE

Rica I	Rica II	Nord-Norge
<b>08.30-10.00</b>		
<b>WP 1.1 Physiology of decay</b>	<b>WP 4.2 Substrate modification and non-biocidal treatments</b>	<b>WP 2.3 Chemical/physical test methods</b>
<b>Convener: Dr Sungmee Choi</b>	<b>Convener: Prof Dr Holger Militz</b>	<b>Convener: Mr Ed Suttie</b>
<p><b>IRG/WP 06-10573</b> Biological variability in the oxalate/oxalate decarboxylase system among five isolates of the wood-degrading fungus <i>Meruliporia incrassata</i> C Howell, J Jellison</p> <p><b>IRG/WP 06-10575</b> Micromorphological Characteristics of Degradation in Bamboo Attacked by White Rot Fungus <i>Lentinus edodes</i> Chang Hyun Cho, Kwang Ho Lee, Yoon Soo Kim</p> <p><b>IRG/WP 06-10576</b> Micromorphology of Bamboo Fibers Degraded by Brown-Rot Fungus <i>Gloeophyllum trabeum</i> Kwang Ho Lee, Chang Hyun Cho, Yoon Soo Kim</p> <p><b>IRG/WP 06-10572</b> <i>In vitro</i> antifungal activity of chilli against wood degrading fungi T Singh, C Chittenden, D Vesentini</p>	<p><b>Heat treatment</b></p> <p><b>IRG/WP 06-40339</b> The commercialisation of ThermoWood® products D Jones, E Suttie, J Ala-Viikari, N Bergstrom, D Mayes</p> <p><b>IRG/WP 06-40332</b> Heat treatment of less-valuable Nigerian-grown <i>Ceiba pentandra</i> wood for improved properties L Awoyemi</p> <p><b>IRG/WP 06-40333</b> Improvement of <i>Grevillea robusta</i> durability using heat treatment F Mburu, S Dumarçay, F Huber, M Petrissans, P Gérardin</p> <p><b>IRG/WP 06-40344</b> Assessment of the Envelope Effect of Three Hot Oil Treatments: Resistance to Decay by <i>Coniophora puteana</i> and <i>Postia placenta</i> M J Spear, C A S Hill, S F Curling, D Jones, M D Hale</p>	<p><b>WP 2.4 International standardization</b> Convener: Dr Mick Hedley</p> <p><b>IRG/WP 06-20337</b> Japanese Classification of Wooden Building Members for ISO Use Classes according to the Building Code in Japan. K Suzuki</p> <p><b>WP 2.3</b></p> <p><b>IRG/WP 06-20321</b> Determination of corrosive effect of liquid wood preservatives to metals – First experiences with a National Standard which is in revision E Melcher</p> <p><b>IRG/WP 06-20328</b> Time-of-Flight Secondary Ion Mass Spectrometry Analysis of Polyethylene Glycol Penetration into Wood Cell Walls D Jeremic, P Cooper, P Brodersen</p>

# THURSDAY 22 JUNE

Rica I	Rica II	Nord-Norge
<b>10.30-12.00</b>		
<b>WP 1.1 Physiology of decay, cont'd</b>	<b>WP 4.2 Substrate modification, cont'd</b>	<b>WP 2.3 Chemical/physical test methods, cont'd</b>
<b>Convener: Dr Sungmee Choi</b>	<b>Convener: Prof Dr Holger Militz</b>	<b>Convener: Mr Ed Suttie</b>
<p><b>IRG/WP 06-10578</b> Common Decay Micromorphology "Anomalies" Challenge Current Decay Classification R Wakeling</p> <p><b>IRG/WP 06-10580</b> Correlation between modulus of elasticity, mass losses and FTIR spectra of copper treated decayed wood M Humar, B Bučar, F Pohleven</p> <p><b>IRG/WP 06-10584</b> The role of oxalic acid in tolerance to N'-N-naphthaloylhydroxylamine in <i>Tyromyces palustris</i> R A Arango, C A Clausen, F Green III</p> <p><b>IRG/WP 06-10590</b> The effect of chitosan on the growth and physiology of two wood-inhabiting fungi D Vesentini, T Singh</p>	<p><b>Chemical modification</b></p> <p><b>IRG/WP 06-40349</b> Furfurylated wood - An alternative to Preservative-treated wood S Lande, M H Schneider, M Westin, J Phillips</p> <p><b>IRG/WP 06-40347</b> Chemical reactions involved in furfurylation of solid wood - An investigation by ATR-IR spectroscopy T Mark Venås, L Garbrecht Thygesen, S Barsberg</p>	<p><b>IRG/WP 06-30391</b> Water analysis in chemicals, wood or chemically treated wood using a new analytical method for selective water detection R Craciun, D Taylor</p> <p><b>IRG/WP 06-20333</b> Moisture correction for ultrasonic MOE measurements above fibre saturation point in Scots pine sapwood E Larnøy, G Alfredsen, H Militz</p> <p><b>IRG/WP 06-20334</b> Effect of wood decay on the proportional limit of thin wood samples stressed in the bending mode Gan Li, D D Nicholas, T P Schultz</p>

# THURSDAY 22 JUNE

Rica I	Rica II	Nord-Norge
<b>13.30-15.00</b>		
<b>WP 1.2 Soft rot and bacteria</b>	<b>2.1 Alternative methods to detect fungal decay</b>	<b>WP 4.4 Treatment processes and treatability of timber</b>
<b>Convener: Dr S Nami Kartal</b>	<b>Convener: Ms Lesley Francis</b>	<b>Convener: Dr Mark Mankowski (acting)</b>
<p><b>IRG/WP 06-10587</b> Evidence for Basidiomycete Tunnelling in <i>Pinus radiata</i> and <i>Fagus sylvatica</i> R Wakeling</p> <p><b>IRG/WP 06-10582</b> Laboratory Evaluation of Soft Rot Resistance of Non-Durable Lesser-Known Malaysian Hardwoods A H H Wong</p>	<p><b>IRG/WP 06-20326</b> Identification of fungi colonising coated and modified wood exposed outdoors using sequencing and T-RFLP profiling U Råberg, J Bijelovic, C J Land, S Bardage, N Terziev</p> <p><b>IRG/WP 06-20336</b> Investigation on a Wood Decay Biomarker S Mounguengui, S Dumarçay, P Gérardin</p> <p><b>IRG/WP 06-20339</b> High-energy multiple impact (HEMI)-test – Part 2: A mechanical test for the detection of fungal decay C R Welzbacher, C Brischke, A O Rapp</p>	<p><b>IRG/WP 06-40345</b> Determination of physical properties of wood by Novel Guide I Usta, M D Hale</p> <p><b>IRG/WP 06-40330</b> Assessment of the ease of preservative treatment in the less-valuable Nigerian-grown <i>Ceiba pentandra</i> wood L Awoyemi, A J Pitman</p> <p><b>IRG/WP 06-40346</b> A behaviour of CCA penetration of fir (<i>Abies bornmulleriana</i> Mattf.) at different ramp times and constant vacuum/pressure applications I Usta, R Despot, M Hasan</p>

# Tabled papers

## Section 1 Biology

IRG/WP 06-10569

The effect of mortality diseases on wood quality of sissoo (*Dalbergia sissoo* Roxb)

M M Islam, M O Hannan, G N M Ilias

IRG/WP 06-10570

Comparative study on physical properties of four fast growing timber species of Bangladesh

M M Islam, B K Dey, M O Hannan, G N M Ilias

IRG/WP 06-10574 (POSTER PAPER)

Fun with Soil Block Jars: Teaching fungal wood decay in the classroom

C Howell, L Gott, B Meehan

IRG/WP 06-10577

Bamboo: A Material Rediscovered

S Kumar

IRG/WP 06-10583

The "wire-loop slicing technique" for the rapid field collection of large numbers of *Coptotermes acinaciformis* termites from above-ground mound colonies.

B M Ahmed, J R J French

IRG/WP 06-10586

Future termite control requires partnership between industry, government and people.

J R J French, B M Ahmed

IRG/WP 06-10596

Decay resistance of coconut and rubber woods. Alternative wood species from Ghana

S Amartei, M Humar, B Donkor, F Pohleven

IRG/WP 06-10599

Comparing microbial colonisation and decay rates of wood from sound and aphid-killed Kenyan-grown Mexican cypress (*Cupressus lusitanica*)

R Venkatasamy

## Section 2 Test methodology and assessment

IRG/WP 06-20322

Manual for inspection of waterborne preservative treated timber products

A K Lahiry

IRG/WP 06-20338

The use of modulus of elasticity and modulus of rupture to assess wood decay in laboratory soil bed test

A Temiz, Ü C Yildiz

IRG/WP 06-20350

Standard Test Methods for Wood Preservatives by Laboratory Agar-Block Test

P K Sarker, M A Rahman, M R Bulbul, T Das, G N M Ilias

## Section 3 Wood protecting chemicals

IRG/WP 06-30392

The effect of woody and non woody plants extractives on microbial resistance of non-durable species

S M Kazemi, A Hosinzadeh, M B Rezaii

IRG/WP 06-30394

Protection of hard and softwood through Neem leaves extracts and oil - A direction towards development of eco-friendly wood preservatives  
S Dhyani, S Tripathi

IRG/WP 06-30396

Preliminary screening of a boron based wood preservative for biological efficacy (fungicidal) in treated timber  
S R Przewloka, J A Hann, P Vinden

IRG/WP 06-30398

One year performance of graveyard stakes in the Northern Territory of Australia  
B Ahmed, J Hann, S Przewloka, P Vinden, P Blackwell, P Plews

IRG/WP 06-30403

Efficacy of some fungicides against mold on freshly cut beech sawn wood  
A Fojutowski, A Kropacz

IRG/WP 06-30411

Ionic liquids with organic and inorganic anions as highly active wood preservatives  
J Zabielska-Matejuk, A Skrzypczak

## Section 4 Processes and properties

IRG/WP 06-40322

Non-pressure preservation technique of five less durable timber species – Kadam (*Anthocephalus cadamba*), Shimul (*Bombax ceiba*), Pithalu (*Trewia nudiflora*), Am (*Mangifera indica*) and Boroï (*Ziziphus jujube*) of Bangladesh  
G N M Ilias, A H Kabir, F Begum, M F Alam

IRG/WP 06-40323

Biocide Treatments for Wood Composites—A Review  
J W Kirkpatrick, H M Barnes

IRG/WP 06-40324

Comparative study between dipping and Boucherie method of bamboo preservation  
A S M A Huda, S M Mithue, M N Islam, M O Hannan

IRG/WP 06-40325

Underwater shock treatment for improvement of penetration of wood  
S Itoh, H Maehara, K Tanaka, T Echigo, K Morioka, E Shirai, K Nishimoto

IRG/WP 06-40326

Influence of Acetylation on Fire Resistance of Beech Plywood  
B Mohebbi, A Talaii, A Karimi, S Kazemi Najafi

IRG/WP 06-40327

Performance evaluation of Borax: Boric Acid treated Green bamboo through new VAC-FRI and conventional processes  
S Tripathi, S N Nautiyal

IRG/WP 06-40328

The Effect of Wick Action upon Moisture Distribution in Ellagate Treated *Pinus radiata* Wood  
S R Przewloka, B J Shearer, J A Hann

IRG/WP 06-40334

Copper Borate for the Protection of Engineered Wood Composites  
R Smart, W Wall

IRG/WP 06-40335

The development of a novel method to preserve reeds using an environmentally friendly timber preservative and a unique engineering design  
K Govender, K G Moodley

IRG/WP 06-40336

CCB Preservative treatment of split muli (*Melocanna baccifera*) bamboo by soaking process

K Akhter, M H Chowdhury

IRG/WP 06-40337

Study on Tanalith E treatability of rubberwood (*Hevea brasiliensis*) grown in Bangladesh

A K M Bosunia, M O Hannan, A A Mahfuz, M A Islam, M N Islam, K Mahmud, A K Lahiry

IRG/WP 06-40340

Further discussion of biological durability assessments of acetylated wood from several European institutes

D Jones, W Homan, F Bongers

IRG/WP 06-40348

Protection of a low-density mangrove timber species gewa (*Excoecaria agallocha*) through preparation of particleboard – An Assessment

A A Mahfuz, M O Hannan, M A Islam, M N Islam, M M Islam, A K Lahiry

IRG/WP 06-40350

Effect of fire retardants (monoammonium phosphate and diammonium phosphate, mixture of monoammonium phosphate and borax and ammonium sulphate) on beech wood with dipping and Lowry methods

M Akhtari, D Parsapajouh, M Arefkhani

IRG/WP 06-40352

Comparative studies on penetration and retention of CCA (C) and creosote in wood from aphid-killed and sound Kenyan-grown Mexican cypress (*Cupressus lusitanica*)

R Venkatasamy, F M Opar

## **Section 5 Environmental aspects**

IRG/WP 06-50237

Criteria for environmentally and socially sound and sustainable wood preservation industry

A K Lahiry, M R Hasan, M A J H Chowdhury

IRG/WP 06-50241

Leaching of CCA from *Paraserianthus falcataria* panels exposed to field conditions at Krishnapatnam harbour, Andhra Pradesh

B Tarakanadha, K S Rao