TABLE OF CONTENTS

KEYNOTE ADDRESSES	
Forest Products and the Environment: A Productive Symbiosis <i>Howard N. ROSEN</i>	1
Taiwan Forestry – Current Status and Strategy to Global Warming <i>Min-Chyuan YEH</i>	2
Forest Products: Need for a Rethink SALLEH Mohd Nor	9
Wood and Competing Materials Alfred TEISCHINGER	10
A Discussion on the Development of the Furniture Industry & Ecological Environmental Symbiosis Jack CHEN	21
Forest Products and Environment – A Productive Symbiosis <i>Ute SEELING</i>	31
The Role of Wood Products in Meeting Ecological Objectives of Sustainable Forest Management <i>R. James BARBOUR</i>	39
IUFRO and the Challenge of Change Robert L. YOUNGS	49
SPECIAL SESSION – IAWS ACADEMY LECTURE A Scientific Itinerary: Physical Chemistry to Wood Science Xavier DEGLISE	60
5.01.00 - WOOD QUALITY	
Acoustic Assessment of Wood Quality of Raw Forest Materials – A Path to Increased Profitability <i>Xiping WANG, Peter CARTER, Robert ROSS, and Brian BRASHAW</i>	61
Density Profiles of Tension Wood Teak Mayuree DOUNGPET	62
Relationship between Growth Rate and Wood Properties in <i>Populus deltoides</i> Grown under Stressful Site Conditions *Mayuree DOUNGPE, Ilona PESZLEN and Richard HALL*	63
A Multi-parameter Approach to Characterize Wood Quality for Particle Boards *Rupert WIMME and Martin WEIGL*	64
Predicting the Quality of Sitka Spruce Sawn Timber from Standing Tree and Log Measurements Shaun MOCHAN, Tom CONNOLLY, Barry GARDINER and David LESLIE	65
A Summary of Research Conducted by the Wood Quality Consortium Laurence SCHIMLECK, Alexander CLARK, Richard DANIELS and Lewis JORDAN	66
5.05 A – USING PLANTATION AND SMALL-DIAMETER TIMBER IN COMPOSITES Some of the Mechanical Properties of Cement Bonded Particleboard Manufactured from Alder, Eucalyptus, and Spruce Mustafa ASLAN, Erhan GOKALP and Salim HIZIROGLU	67
Fire-retardant-treated Low-formaldehyde-emission Particleboard made from Recycled	0,
Wood-waste Song-Yung WANG, Te-Hsin YANG, Li-Ting LIN, Cheng-Jung LIN and Ming-Jer TSAI	68
Utilization of Non-conventional Tropical Lignocellulosic Resources for the Hardboard Production SABIHA Salim, ZAIDON Ashaari, RASMINA Halis, MOHD. NOR Mohd Yusuf and PARIDAH Md. Tahir	1 69
Oriented Strandboard from Small-diameter Southern Pine Trees Guangping HAN, Qinglin WU and Shigehiko SUZUKI	70
Effects of PF Resin Impregnation on Mechanical-physical Properties of Poplar LVL Huanrong LIU, Junliang LIU and Yubo CHAI	71

Lightweight Wood Composite Boards made of Paulownia R. C. TANG, C. Y. HSE and T. F. SHUPE	72
Posters 5.05 A	
Date Palm (<i>Phoenix dactylifera L.</i>) pruning Residues as a Raw Material in MDF Production H. HOSSEINKHANI and A. R. KHARAZIPOUR	<i>73</i>
The Use of Waste Banknote Paper in Particleboard Manufacturing A. ENAYATI and O. HOSSEINAEE	74
Improvement of Bondability in the Manufacture of Rice Husk Particleboard Javad TORKAMAN and Seed Mehdi FATEHMY	75
Study on Particleboard made by Using Agricultural Residues Tien-Tien CHEN Wun-Jheng HUANG and Hong-Ding SOONG	76
Study on Application LWA-bamboo Board for Construction Engineering - The Bond and Mechanics Property of LWA-bamboo Board Yu-Wen LIU, Jin-Cherng HUANG, Yin-Wen CHAN and Sun-Wen JUAN	77
5.07 A – ENERGY FROM BIOMASS The Biorefining Story: Progress in the Commercialization of Biomass-to-ethanol <i>Warren E. MABEE and Jack N. SADDLER</i>	<i>78</i>
Biomass Energy Technology in Asia – Issues and Challenges Why Kong HOI	79
Energy from Forest Biomass – Present Challenge for Future Generations of Moldova <i>Vitalie GULCA</i>	80
Bio-energy: Conversion and Utilization of Wood as Bio-fuel in Nigeria Joseph Adeola FUWAPE	81
Importance of Woody Biomass Research on Plantation Resources in South East Asia <i>K. YAMAMOTO, T HARADA, M. JINKAWA, M. KUBOYAMA, M. MIYAMOTO, M.SUZUKI, R.TANAKA, E.TOGAWA and T. YOSHIDA</i>	82
5.11 A – NON-WOOD FOREST PRODUCTS-ALTERNATIVE FOREST PRODUCTS FOR A SUSTAINABLE FUTURE Almaciga (<i>Agathis philippinensis</i> Warb.) Resin Production and Market Opportunity for Upland Communities in Karagan Valley, Province of Compostela Valley (COMVAL), Mindanao, Philippines Arsenio B. ELLA, Moreno L. SANTANDER Jr. and Caroline Marie C. GARCIA	83
	03
Effect of Pressing Time on Physical and Mechanical Properties of Phenolic Impregnated Bamboo Strips MOHD. KHAIRUN Anwar Uyup*, PARIDAH Md. Tahir, HAMDAN Husain, EDI	
SUHAIMI Bakar and ABD. LATIF Mohmod Targeting the Challenges of Gum-Arabic Agroforestry System Disappearance through Incentives	84
Based System under Rapid Commercialization: Factor Affecting Farmers Land Use Options in Gum Belt of Western Sudan Tarig GIBREE, Siegfried BAUER and Fazli RABBI	85
Non-Wood Forest Products in Poverty Alleviation: A Case Study from the Far-Western Region of	03
Nepal Swoyambhu Man AMATYA and Giridhar AMATYA	86
Posters 5.11 A	
Antibacterial Compounds from the Bark of Cryptomeria japonica D. Don Wen-Hsin LI, Shang-Tzen CHANG, Shan-Chwen CHANG and Hui-Ting CHANG	87
Effect of Heat Treatment on Properties of Cultivated Bambusa vulgaris Bamboo Razak WAHAB, Hashim W. SAMSI, Othnab SULAIMAN, Rafidah SALIM and Rokiah HASHIM	88
Non Timber Products in West-Iran Forests (Case study: <i>prstacia mutica</i> Seed in Chaharmahal & Bakhtiavi Province)	0.4
H JAHANBAZI, Y IRANMANESH and M TALEBI Bamboo-based Income Generating Activity and its Role on Rural Livelihood	89
Damoud-Dascu income denerating Activity and its Role on Ruiai Livelinood	

Mandira SHARMA	90
Antifungal Activity of Essential Oils from <i>Cryptomeria japonica</i> and their Constituents Sen-Sung CHENG and Shang-Tzen CHANG	91
Sustainable Utilization of Medicinal Plants, a Non-wood Forest Product: A Biotechnological Approach for their Propagation and Cultivation Shyamal K. ROY and A.K.M. SAYEED HASSAN	92
Beneficial yet Lesser Known Ally of the Forest (Preservation of Bayuko) Angelito B. EXCONDE, Jose Alan A. CASTILLO, Digno C. GARCIA, Florentina D. OLIVA, Mary Grace R. ALVAREZ	93
Non-timber Forest Products and Use of Agroforestry: AKECOP's Collaborative Forest Restoration Research *Don Koo LEE, Monton JAMROENPRUCKSA, Dudung DARUSMAN and Woo Sung KIM**	94
Pulp & Paper A – CHEMICAL PULPING AND LIGNIN CHEMISTRY Estimation of Softwood Pulp Yields in Kraft Cooking with AQ and Polysulfide	
Shiho TAKAHASHI, Akiko NAKAGAWA and Hiroshi OHI Effects of Liquor to Wood Ratio and Sulfide Concentration on Pulp Yields in Polysulfide Cooking of Eucalyptus Woods	95
Keigo WATANABE, Mitsuko HONMA and Hiroshi OHI	96
Activation of Kraft Pulps with Nitric Acid Prior to Oxygen Delignification <i>Evren E. KALYONCU and Emrah PESMAN</i>	97
Variety of Lignin Structure in Angiosperms and their Reaction Woods Yuji MATSUMOTO, Deded Sarip NAWAWI, Wasrin SHAFII, Hirotaka NAKAMURA, Takuya AKIYAMA, Tomoya YOKOYAMA and Gyosuke MESHITSUKA	98
Structural Changes of Lignin Preparations under the Heat during DSC Analysis Satoshi KUBO, Tatsuhiko YAMADA, Koh HASHIDA and John F. KADLA	99
Effect of α - Carbonyl Group on the Lignin Reaction under Alkaline Conditions <i>Aiko IMAI, Tomoya YOKOYAMA, Yuji MATSUMOTO and Gyosuke MESHITSUKA</i>	100
Posters Pulp & Paper A Preparation of Amphipathic Thermal Moldable Lignin in the Biomass Conversion of Softwood Using Acid-Catalyzed Solvolysis	101
Tatsuhiko YAMADA, Satoshi KUBO and Yasumitsu URAKI Lignin Structural Changes during EMCC Pulping of the Triploid of Chinese Aspen Yu LIU, Huaiyu ZHAN and Jiachuan CHEN	101 102
5.02 A – RESOURCE CHARACTERISATION A Physical and Mechanical Properties of Six Mangium Provenances from South Sumatra and West Java Indonesia N. HADJIB, A. PRAWIRA and Y.S. HADI	103
Branch Wood as an Alternative Material Resource. A Comparison of Microscopic Structure and Mechanical Properties of Branch and Stem Wood Marina CIONCA, Lidia GURAU, Hugh-MANSFIELD WILLIAMS and Gervais SAWYER	104
Anatomic and Mechanical Properties of Schizolobium amazonicum on Different Ages Rodrigo Figueiredo TEREZO and Carlos Alberto SZÜCS	105
Interrelationships among Quality Index for Structural Use of Hardwoods Masataka TERANISHI, Akio KOIZUMI and Takuro HIRAI	106
The Physical and Mechanical Properties of some Fast-growing Secondary Forest Species of Sarawak, Malaysia **Andrew Nyorik NIBU*	107
Diverse Strategies of Mechanical Mechanisms of Branches in Several Angiospermous Trees Chin-Chu TSAI, Yan-San HUANG, Gwo-Shyong HWANG, Shin-Shin CHEN, Shiang-Jiuun CHEN and Ling-Long KUO-HUANG	108
Posters 5.02 A Properties of Endospermum Malaccense M.A. and Azadirachta excelsa in Peninsular Malaysia	, 3

Hamdan HUSAIN, Mohd. Tamizi MUSTAFA, Mohd. Khairun Anwar UYUP and Ahmad Zuhaidi YAHYA	109
Bending Properties of Taiwan Red Cypress Plantation Trees grown with Different Thinning Treatments	
Cheng-Jung LIN and Chih-Ming CHIU	110
5.04.00 – WOOD PROCESSING Adaptive and Flexible Production Systems for Woodworking Industry Arto USENIUS	111
Oil Palm Trunks – A New Alternative Material for Solid Wood and Veneer-Based Products Edi Suhaimi BAKAR, Mohd. Hamami SAHRI, Zaidon ASHAARI and Fauzi FEBRIANTO	112
Online Wood Industries Database László SZALAI, Ákos BAUSZ, János BOROS	113
Posters 5.04.00 Reducing Inventory Cost by using Value Stream Mapping in a Furniture Factory Emine GUNDOGDU, Ercan TANRITANIR and M. Bulent DURMUSOGLU	114
5.06 A – PROPERTIES AND UTILIZATION OF PLANTATION WOOD Characteristics of <i>Populus tremula</i> (L.) and <i>Populus tremula x tremuloides</i> Stems in Southern Finland	
Henrik HERÄJÄRVI and Reijo JUNKKONEN	115
Taper Modeling on Taiwania Plantation in Liukeui Area in Taiwan Dar-Hsiung WANG, Han-Ching HSIEH and Shyh-Chian TANG	116
Eucalyptus Management for Higher Value Utilisation in Europe and South America <i>Leif NUTTO</i>	117
Density Variation and Drying Characteristics of Oil Palm (<i>Elaeis guineensis</i>) Wood <i>Kee Seng GAN</i> , <i>Seng Choon LIM and Heok Choh SIM</i>	118
Potential of SilviScan-3 and NIR Technologies in Estimating the Longitudinal Shrinkage of Eucalypt Species Jun Li YANG, Rob EVANS, Roger MEDER and Nick EBDON	119
Comparison of Wood Density and Anatomical Properties between Coppiced Trees and Parent Crop of Six <i>Eucalyptus</i> Genotypes **Anton ZBONAK, Tamara BUSH and Valerie GRZESKOWIAK	120
Evaluation of Bending and Compression Strengths of Poplar Plantation Wood using Three Non-destructive Methods	
Yafang YIN, Lijuan WANG, Bo LIU and Xiaomei JIANG Posters 5.06 A	121
Effects of Log Grading and Sawing Methods on Yield of Sugi Laminae for Structural Glulam Hideki MORITA, Yoshiyasu FUJIMOTO, Takanori ARIMA and Yasuhide MURASE	122
5.12 A – EMERGING THEMES FOR SUSTAINABLE UTILIZATION OF FOREST PRODUCTS	
Recycling Wood Waste from Construction Sites into Value-Added Products MARIA ZURA Mohd. Zain, HAMDAN Husain, ROZITA Ahmad and ROSAZLIN Abdullah	123
Wood-Plastic Composites from Beetle-killed Spruce: An Opportunity for Sustainable Economic Contribution in the Kenai Peninsula, Alaska Vikram YADAMA, Eini C. LOWELL, David NICHOLLS and Nels PETERSON	124
Non-destructive Evaluation of Wood Quality in Standing Douglas-fir Trees and Logs David BRIGGS, Eini LOWELL, Eric TURNBLOM and Gonzalo THIENEL	125
Bioenergy from Sustainable Use of Forest Biomass in Atlantic Canada; Benefits and Challenges for the Forest Industry	10.
Rajendra CHAINI Posters 5.12 A	126
F-structure A & S – A Tool for Forest Structure Analysis and Simulation NGUYEN Van Sinh	127

Logging Damage on Forest Regeneration and Soil F TAVANKAR, B MADJNOUNIAN and A. E. BONYAD	128
IAWA A – INTERNATIONAL ASSOCIATION OF WOOD ANATOMISTS SESSION A Ecological Wood Anatomy of <i>Pinus wallichiana</i> (Pinaceae) in Central Nepal <i>Lajmina JOSHI</i>	129
Anatomical and Cellular Characteristics of Secondary Xylem in <i>Pinus thunbergii</i> grown under Boron Deficient Conditions **Kwang Ho LEE, Jong Sik KIM and Yoon Soo KIM**	130
Anatomical Characteristics of Kenaf Grown in Korea Seon-Hwa LEE, Sung-Min KWON and Nam-Hun KIM	131
Anatomical Properties of <i>Acacia mangium x Acacia auriculiformis</i> Hybrid Planted in Sarawak, Malaysia <i>Ismail JUSOH and Norfaizah MUHAMAD</i>	132
Cell Wall Chemistry and Knotwood Structure of Norway Spruce (<i>Picea abies</i> [L.] Karst) Studied by Confocal Raman Microscopy	
Riikka PIISPANEN, Notburga GIERLINGER and Pekka SARANPÄÄ Development of Improved Methods to Identify Shorea Wood and its Origin Tomoyuki FUJII, Hisashi ABE, Akira KAGAWA, Atsushi KATO, Yoshihiko TSUMURA, Kazumasa YOSHIDA and Hiroshi YOSHIMARU	133 134
5.03-IRG A – FUNGAL DEGRADATION OF WOOD I	
Control of Moisture Content in Wood Materials for Mould Growth <i>Dian-Qing YANG</i>	135
White Rot in Eucalypts Wood: Anatomical Changes and Density Variation by X-ray Densitometry Mario TOMAZELLO F, Sérgio BRAZOLIN and Matheus P. CHAGAS	136
Effect of Compatibilizer on the Natural Durability of Wood Flour/High Density Polyethylene Composites against the Rainbow Fungus (Coriolus versicolor) Sara POURABBASI, A. KARIMI, D. PARSAPAJOUH, M. TAJVIDI and M. SOLEYMANI	137
Posters 5.03-IRG A Laser Stain Removal of Fungus-induced Stains on Paper-based Cultural Relics Chyi Shiah TSANG, Han Chien LIN	138
Analysis of Pyrolyzed Products from Moso Bamboo Charcoalization and Assessment for its Anti-fugal and Anti-mite Application Haw-Farn LAN and Ting-Yin HU	139
Progressive Microscopic Changes in Yellow Meranti Wood Caused by White-rot Fungus of <i>Phlebia brevispora</i>	
ERWIN, Won-Joung HWANG, Shuhei TAKEMOTO and Yuji IMAMURA	140
Evaluating the Potency of Cinnamaldehyde as a Natural Wood Preservative <i>Chun-Ya LIN, Chi-Lin WU and Shang-Tzen CHANG</i>	141
From Research Project to Laboratory Accreditation: The Study Case of the Evaluation of Plywood Resistance towards Fungi according to XP ENV 12038 Luc MARTIN, Marie-France THEVENON and Nicolas LEMENAGER	142
Effect of Fiber Type and Content on the Natural Durability of Wood Flour/high Density Effect of Compatibilizer on the Natural Durability of Wood Flour/high Density Polyethylene Composites against Rainbow Fungus (<i>Coriolus versicolor</i>) A. KARIMI, M. TAJVIDI and S. POURABBASI	143
	173
5.04.06 – WOOD DRYING Moisture Dependence of Dynamic Viscoelastic Properties for Drying Treated Wood Jiali JIANG and Jianxiong LU	144
Suitability of the Use of Microwave Modification as a Total or Partial Drying Method in the Processing of <i>Pinus Rradiata</i> Heartwood. Part 1: Investigations on the Harmful Effects <i>Lawrence AWOYEMI</i>	145

The Influence of Elevated Temperatures on Selected Properties of Rubberwood Huei Shing SIK, Zakaria SARANI, Ahmad SAHRIM and Kheng Ten CHOO	146
Potential of High-temperature Drying for the Production of Value-added Products <i>Yves FORTIN and Aziz LAGHDIR</i>	147
Posters 5.04.06	
Mechanical Characteristics of Wood under High Temperature and Pressurized Steam Wanli CHENG Yixing LIU and Toshiro MOROOKA	148
Investigation on the Hygroscopic Characteristics for the Collapsed and Non-collapsed Sections of Plantation-grown <i>Eucalyptus</i> Wood Subjected to High-temperature Drying <i>Yiqiang WU, Yanmei WU, Wanxi PENG and Yuan LIU</i>	149
Effect of Temperature on Changes in Physical Properties of Wood Below and above the Fiber Saturation Point *Roger E. HERNÁNDEZ and Zaira SILVA*	150
Improving the Dimensional Stability of Different Wood Species by Thermal Modification <i>Denny OHNESORGE, Gero BECKER and Claudia STOLERU</i>	151
5.05 B – ADVANCES IN WOOD - POLYMER AND MODIFIED-WOOD COMPOSITES Selected Properties of Recycled HDPE and Wood/Natural Fiber Composites Qinglin WU, Yong LEI, Fei YAO and Yanjun XU	152
Physical and Mechanical Properties of Methyl Methacrylate Impregnated Betung Bamboo (<i>Dendrocalamus asper</i>)	
Y.S. HADI, N. HADJIB and M. UTAMA	153
Comparing Nano-mechanical Properties of the Wood Cell Wall by Nanoindentation Siqun WANG, Yan WU, Cheng XING, George M. PHARR, Dingguo ZHOU and Yang	
ZHANG	154
Property Change of a Rice-hull-PE Composite Exposed to UV Weathering Weihong WANG, Qingwen WANG and Wenjie DANG	155
Polymer Materials Prepared from Forest Resources Fuxiang CHU, Mingtao LIN and Chunpeng WANG	156
Study on the Biomorphous Ceramics Derived Wood and Bamboo by Sol-gel <i>Zhilin CHEN</i> , <i>Feng FU</i> , <i>Jinlin WANG and Kelin YE</i>	157
5.07 B – ENERGY FROM BIOMASS / CHEMICALS FROM WOOD Poster 5.07 B	
Manufacturing Powder Activated Carbon from Moso Bamboo (<i>Phyllostachys Pubescens</i>) with Potassium Salts	150
Sheau Horng LIN	158
Chemical and Cytotoxic Constituents from the Leaves of Cinnamomum subavenium Soong-Yu KUO, Wen-Li LO, Chung-Yi CHEN, Jin-Cherng HUANG and Hsien-Tuang HUANG	159
Effective and Environmental Friendly Energy Utilization of Forest Biomass Vitezslav MASA, Martin PAVLAS, Jiri HAJEK and Alois SKOUPY	160
Carbon Stock and Decreasing of Carbon Dioxide Emissions by using Timber <i>Takanori ARIMA</i>	161
Carbon Flow and Stocks from Consumption of Wood Materials and Wood Products in Taiwan Jiunn-Cheng LIN, Ming Kuang WANG and Yi-Chung WANG	162
Antibacterial and Antioxidant Activities of Ethanolic Extract from <i>Michelia formosana</i> Bark Lan-Ting GU, Shang-Tzen CHANG and Hui-Ting CHANG	163
Isolation and Identification of Antifungal Constituents from the Heartwood Extracts of Taiwan Hinoki (<i>Chamaecyparis obtusa</i> var. <i>formosana</i>) **Chi-Lin WU and Shang-Tzen CHANG**	164
Carbon Sequestration through Different Strategies of Forest Management in Plantation Forests of Japanese Cedar (<i>Cryptomeria japonica</i>) in Taiwan <i>Yi-Chung WANG, Ming-Kuang WANG and Jiunn-Cheng LIN</i>	165
Volatile Oil from Fucalizatus Species as Novel Righerhicides	

Daizy R. BATISH, Shalinder KAUR, Harminder Pal SINGH and Ravinder K. KOHLI	166
Vermicomposting of Litter of <i>Populus deltoides</i> : An Excellent Manure for Organic Framing <i>Harminder Pal SINGH, Daizy R. BATISH and Ravinder K. KOHLI</i>	167
Anti-inflammation Activities of Essential Oil and its Constituents from Indigenous Cinnamon (Cinnamomum osmophloeum) Twigs	
Yu-Tang TUNG, Meng-Thong CHUA, Sheng-Yang WANG and Shang-Tzen CHANG	168
Mosquito Larvicidal Activity of Ethanolic Extracts of Cryptomeria japonica Hui-Jing GU, Sen-Sung CHENG, Hui-Ting CHANG and Shang-Tzen CHANG	169
Biomass and Bio-based Products Research at the USDA Forest Service World LS. NIEH	170
The Antioxidant Activity and Protective Effect of Extracts from the Stem of <i>Vitis kelungeusis</i> on Carbon Tetrachloride-induced Acute Liver Injury in Mice <i>Kai-Chung CHENG, Lie-Fen SHYUR, Chi-Chang HUANG, Shih-Chang CHIEN and Jyh-Horng WU</i>	171
Removal of Heavy Metal Ions from Aqueous Solutions by Modified Bamboo Wastes <i>Fu-Lan HSU and Hong-Lin LEE</i>	172
5.12 B – INTEGRATING FOREST PRODUCTS WITH ECOSYSTEM SERVICES Entrepreneurship and Innovativeness in the Norwegian Nature-based Services Industry Erlend NYBAK and Eric HANSEN	173
Confronting Sustainable Forestry in a Period of Uncertainty and Change: Forest Certification's Role as a Market-based Catalyst Masami SHIBA and Naoya OGAWA	174
Forest Products and Ecosystem Services: Using Market Based Approaches to Increase Forest Value	175
Robert L. DEAL and Xiaoping ZHOU Carbon Banking: Flexibility for Forest Owners Hugh BIGSBY	175 176
Posters 5.12 B	1/0
Acid Rain Impact in Forest Soil K. S. PATEL, B. AMBADE, B. BLAZHEV and R. M. STEFANOVA	177
5.01.01 – BIOLOGICAL CONTROL OF WOOD QUALITY	
Variation in Growth Strains in Five Clones of Eucalyptus tereticornis Pankaj K. AGGARWAL and Shakti S. CHAUHAN	178
Investigation of Within-tree and Between-site Resin Canal Variation in Radiata Pine Jun Li YANG, Geoff DOWNES, Fiona CHEN and Dave COWN	179
Environmental Control of Wood and Tracheid Properties in Norway Spruce (<i>Picea abies</i> (L.) Karst.)	
Tuula JYSKE, Harri MÄKINEN and Pekka SARANPÄÄ	180
Impacts of Genetics, Silviculture and Environment on the Physical and Mechanical Properties of Sitka Spruce Structural Timber John MOORE, Andrew LYON and Barry GARDINER	181
Growth Stresses and Tension Wood Analysis of <i>Nothofagus betuloides</i> (Mirb) Oerst <i>Maria MANSO MARTIN, Leif NUTTO and Gero BECKER</i>	182
Breeding for Wood Quality and End-products in Radiata Pine: Genetic Relationship and Economic Weights *Harry WU and Milos IVKOVIC**	183
Posters 5.01.01	105
The Effects of the Environmental Stress on the Wood Formation in Acacia mangium Chunhua ZHANG, Hisashi ABE, Katsushi KURODA and Takeshi FUJIWARA	184
5.02 B – RESOURCE CHARACTERISATION B Anisotropic Characteristics of Dynamic Viscoelastic Properties of Wood	

Jianxiong LU and Jiali JIANG	185
Mechanical Properties of <i>Pinus massoniana</i> Tracheids Bo ZHANG, Benhua FEI and Yan YU	186
Mechanical Characteristics of Poplar Wood (<i>Populus alba</i> L.) across the Grain <i>Paola MAZZANTI and Luca UZIELLI</i>	187
Effects of Ring Characteristics on the Compressive Strength and Dynamic Modulus of Elasticity of Seven Softwood Species	
Ming-Jer TSAI, Cheng-Jung LIN, Chia-Ju LEE, Song-Yung WANG, Te-Hsin YANG and Lang-Dong LIN	188
Collapse of the Cellular Structure of Wood induced by Large Compressive Deformation: Experiment on Micro-Samples and Modelling using the MPM (Material Point Method) Patrick PERRÉ and Tuan DINH	189
Posters 5.02 B Estimation of Weibull Parameters for Fracture Toughness of Spruce Shih-Hao LEE	190
Dynamic Viscoelasticity of Young and Mature Bamboo Culm Yoko INOKUCHI and Mario TONOSAKI	191
5.10 A – MARKETING LESSER KNOWN SPECIES, NON-TIMBER FOREST, PRODUCTS & CERTIFICATION	
Marketing of Non-timber Forest Products in India: Opportunities and Challenges <i>Parag DUBEY</i>	192
Improving Forest Management Practices through the Development of Markets for lesser known Species (LKS) in Bolivia **Bob SMITH, Victor COSIO and Tom HAMMETT**	193
Marketing Strategies, Functions, and Benefits of Forest Certification: A Cross-cultural Comparison *Toshiaki OWARI*	194
Certification Descriptions as Branding Tools: An Exploratory Analysis of U.S. Homebuilders and Architects Francisco X. AGUILAR and Richard P. VLOSKY	195
Non-tariff Trade Measures: Economic Impacts on New Zealand's Forest Industry James TURNER, Frances MAPLESDEN, Andres KATZ and Susan BATES	195
Posters 5.10 A	
Chemicals and Wood: Parameters of Acceptability Karen BAYNE and Shaun KILLERBY	197
IAWA B – INTERNATIONAL ACADEMY OF WOOD ANATOMISTS SESSION B The Effects of Site Conditions on Wood Biometric Coefficients in Iranian Beech (Fagus orientalis, Lipsky)	,
Ali VARSHOEE	198
Wood Anatomy of <i>Haloxylon</i> Sp. (Sistaan Province, South Eastern Iran) N. TOGHRAIE, H.R. YAZDANIMOGHADAM and D. PARSAPAJOUH	199
Pathways for Symplastic and Apoplastic Flow between Secondary Xylem and Cambium Peter KITIN, Katsuhiko TAKATA, Ryo FUNADA, Barbara LACHENBRUCH and Hans BEECKMAN	200
The Different Pattern of Cell Death between Ray Parenchyma Cells and Ray Tracheids in Conifers Satoshi NAKABA, Yuzou SANO, Takafumi KUBO and Ryo FUNADA	201
Posters IAWA B	
Variation of Fine Structure within a Stem of some Commercial Softwoods in Korea <i>Dong-Jin EUN, Sung-Min KWON and Nam-Hun KIM</i>	202
Radial Changes in Cell Structure of Taiwan Red Cypress Plantation Trees Chih-Ming CHIU and Cheng-Jung LIN	203
Variation in Fibre Length Distribution in Scots Pine and Norway Spruce	

Olof NILSSON and Tommy MÖRLING	204
Pulp & Paper B – PULPING CHEMISTRY AND SPECIALITY CHEMICALS Evaluation of Cooking Processes for <i>Trema orientalis</i> (Nalita) Pulping M. Sarwar JAHAN, A. RUBAIYAT and R. SABINA	205
Kenaf Bast Fiber Kraft Pulp; an Alternative Substitution of Softwood Kraft Pulp for Reinforcing High Yield Hardwood Pulps *Hossein RESALATI, Nafiseh NASERI and Ali GHASEMIAN*	206
A Study for Industrial Utilization of Acetic Acid Lignin Naonori MIYATA, Sinichi OGINO, Yasumitsu URAKI and Makoto UBUKATA	207
Utilization of Woody Biomass Components Separated by the Atmospheric Acetic Acid Pulping Yasumitsu URAKI, Naoki MIYATA and Makoto UBUKATA	208
5.01.02 – NATURAL VARIATIONS IN WOOD QUALITY Impact of Intensive Forest Management on Wood and Lumber Properties in the S-P-F Species of Eastern Canada S.Y. (Tony) ZHANG	209
Fundamental Factors Responsible for the Colour of Radiata Pine Wood Bernard SW DAWSON, Feng GAO and Chris WILLIAMSON	210
Wood Variation in <i>Pinus kesiya</i> of Khasihills in India <i>Ombir SINGH</i>	211
Intra-tree Variability of Cleavage Resistance of Chinese Fir and I-214 Poplar from Plantation <i>Haiqing REN and Ming XU</i>	212
The Effect of Different Soil Texture on Wood Properties of Populus ×euramericana cv. '74/76' Rongjun ZHAO, Benhua FEI, Bo ZHANG, Li ZHANG and Jinmei XU	213
An Investigation on Variations of some of the Physical and Biometrical Properties of Planted <i>Acer Velutinum</i> in the Longitudinal Direction in North of Iran <i>Habibollah KHADEMI-ESLAM</i>	214
5.02 C – MEAUREMENT METHODS INCLUDING NDT A A Comparison of Three Methods for Determining Young's Modulus of Wood <i>Chih-Lung CHO</i>	215
Estimation of Wood Mechanical Properties by near Infrared (NIR) Spectroscopy YU Huaqiang, ZHAO Rongjun, FEI Benhua, FU Feng and JIANG Zehui	216
Bark Measurements with X-ray Technology Rafael BAUMGARTNER, Udo Hans SAUTER and Jörg STAUDENMAIER	217
Posters 5.02 C Predicting the Hygroscopic Warping of Solid-Wood Plate by Finite Element Analysis *Yiren WANG and Shih-Hao LEE*	218
Effect of Hygroscopic Swelling on Push Load of Wood Dowel Joint Wen-Ching SU and Yiren WANG	219
Mechanical Properties of Structural Lumber Produced from Thinned Logs of Japanese Cedar Grown in Taiwan Chih-Lung CHO, Li-Chwen LIN, Jiunn-Haur CHEN and Huey-Lan WANG	220
Understanding the Dynamic Viscoelastic Properties of Drying Treated Wood Jiali JIANG and Jianxiong LU	221
Effects of Machine Grading Methods on Dimension Lumber Haibin ZHOU, Haiqing REN and Yafang YIN	222
Investigation on Sound-Scattering Performance of the Wooden Interior Decoration Materials <i>F. M. LIN, M. H. SHEN and J. H. FONG</i>	223
5.03-IRG B – FUNGAL DEGRADATION OF WOOD II Antifungal Activity and Synergistic Effect of Cinnamaldehyde Combined with Antioxidants	

against Wood Decay Fungi Fu-Lan HSU, Tsair-Bor YEN, Hui-Ting CHANG and Shang-Tzen CHANG	224
Detection of Anti-Microbial Sapwood Extractives in Non-Durable Scots Pine (Pinus sylvestris),	22,
Rubberwood (Hevea brasiliensis) and Jelutong (Dyera costulata) Andrew H.H. WONG and Raymond B. PEARCE	225
Natural Durability Evaluation of Cypress (<i>Cupressus sempervirens</i> L.) Solid Wood and Mixed Heartwood-sapwood Cypress Plywoods	
Farshid FARAJI, Marie-France THEVENON, Nicolas LEMENAGER, Joseph GRIL and Bernard THIBAUT	226
Fire Safety of Wood Floor Assembly: Model and Full-scale Test <i>Hisa TAKEDA</i>	227
Posters 5.03-IRG B	
Effect of <i>Cinnamomum kanehirae</i> Extractives on the Compositions of the Fermentation Broth of <i>Antrodia cinnamonea Ruo-Yun YEH</i>	228
Construction of an ITS Sequence Database for the Identification and Classification of Wood Rot Fungi	
Sakae HORISAWA, Yoichi HONDA, Shuji ITAKURA and Shuichi DOI	229
Genome-wide Survey of Cellulase Related Gene of White Rot Fungus, <i>Pleurotus ostreatus Tomoyuki TAMENORI and Sakae HORISAWA</i>	230
Floral Changes of Wood-relating Fungi in the Crawl Space of a New Wooden Japanese House Aya TOYOUMI, Sakae HORISAWA, Tsuyoshi YOSHIMURA, Yuji IMAMURA and Shuichi	
DOI	231
5.04.07 – ADHESIVES AND GLUING SESSION	
Study upon the Gluing Shearing Strength of some Adhesive Compounds based on Lignin and Mixed Furan Resin with Furfurylic Alcohol of FC-2 URELIT Type	
Valeriu PETROVICI, Anca Maria VARODI and Emilia-Adela SALCA	232
Bonding Performance of Tropical Fast-growing Wood Species - Bondability of Six Indonesian Wood Species in Relation with Density and Wettability <i>Eka Mulya ALAMSYAH, Masaaki YAMADA and Kinji TAKI</i>	233
Toluene Emission from Epoxy Resin Adhesive Contained a Slight Amount of Toluene	
Junpei HIDA, Masaaki YAMADA, Kinji TAKI and Masao INOUE Ultrasonic Atomization of Wood Resin-Adhesives	234
Xuelian ZHANG, Douglas J. GARDNER and Lech MUSZYNSKI	235
Strength and Long Term Durability of Glued European Beech Timber	224
Denny OHNESORGE and Gero BECKER Novolak PF Resins Prepared from Liquefied Cryptomeria Japonica and used in the	236
Manufacturing of Moldings	
Wen-Jau LEE and Yi-Chun CHEN	237
Postsers 5.04.07 The Use of Various Formaldehyde Scavengers in Urea Formaldehyde Resin for Medium Density	
Fiberboard Sevda BORAN, Mustafa USTA and Sedat ONDARAL	238
Analysis of Change in ROS Free Radical of <i>Pinus kesiya</i> var. <i>langbianensis</i> Heartwood Treated	
with Laccase Yongjian CAO, Xinfang DUAN, Yuanlin CAO and Jianxiong LU	239
Study on Plywood Production with the Thermoplastics Film Ho-Chin CHEN, Po-Chih YANG, Tsai-Yung CHEN and Chun-Hsiung HSU	240
R & D and Application of Bio-Based Phenol Formaldehyde Resin as a Wood Adhesive Hong-Jian ZHANG, Min LING, Zhi-Feng ZHENG, Ben-An LIU and Jian-Ke MEI	241
Investigation on Adhesion of the Resins used for Coating Layer on Yankee Dryer Surface Fateme REZAEI-ARJOMAND and Ali-Akbar ENAYATI	242
Properties of the Polyblends Prepared from Polyhydric Alcohol Liquefied Japanese Fir with	

Epoxy Resin Chiou-Chang WU and Wen-Jau LEE	243
Method of Extracting Tannin from Bark of Acacia mangium Trees for Bio-Based Adhesive YEOH Beng Hoong, PARIDAH Md. Tahir, KOH Mok Poh, MOHD. HAMAMI Sahri, LUQMAN Chuah Abdullah	244
5.14-SWST – EDUCATION AND THE PROFESSIONAL FUTURE OF 21ST CENTURY WOOD SCIENCE	
Considering Changes in Wood Utilization – as seen from Europe <i>Helmuth RESCH</i>	245
Bachelor of Wood Science and Technology: Curricullum Developed for Future Challenges in Wood-based Industry Mohd. HAMAMI, Sahri.*, ZAIDON Ashaari, AWANG NOOR, Ab. G. and PARIDAH,	
Md. Tahir Forget Products Education and Training in Austria: Changes and Challenges	246
Forest Products Education and Training in Austria: Changes and Challenges *Alfred TEISCHINGER and Rupert WIMMER*	247
Wood Science & Technology: Its future as a Profession and its Education in the United States <i>H. Michael BARNES</i>	248
The Extension Education of Forest Products in the Experimental Forest of National Taiwan University	
Ya-Nan WANG, Yu-San TSENG, Chung-Ming CHEN, Li-Chen LIN and Far-Ching LIN Current Changes in Higher Education for the European Wood Industry	249
Heiko THOEMEN and Arno FRUEHWALD	250
Posters 5.14-SWST Outlook on the Forest Products Vocational Education in Taiwan—Honeybee Cultivation and the Manufacturing of Related Products Jan Shou HSIEH, Wen Chen LEE and Li Yu LEE	e <i>251</i>
Society of Wood Science and Technology – A Bridge Linking Academia, Community, Industry and Government Victoria HERIAN	
Wood Science Education Reform in Slovakia Marian BABIAK and Igor ČUNDERLÍK	252
Raising Interest for Forest Products among Students Michaël RIVOIRE	254
Turkish Forest Products Industry and Forest Products Engineering Education Ahmet KURTOGLU, Ercan TANRITANIR and Seda ERDINLER	255
Society of Wood Science and Technology 2008 Annual Convention Cosponsored by IUFRO Division 5-Forest Products and Universidad del Bio Bio	254
Victoria HERIAN	256
5.01.06 – WOOD QUALITY FROM INTENSIVE MANAGEMENT Growth Performance of Certain Tree Species planted with Crop Plants on Coal Mine Spoil in a Dry Tropical Environment: An Implication for Soil Redevelopment	
A. N. SINGH Plantation Density and Thinning Effects on the Trackeid Longth and Maturing Age of	257
Plantation Density and Thinning Effects on the Tracheid Length and Maturing Age of Japanese-cedar Grown in Taiwan Pei-Yu KUO, Jin-Hau CHEN and Song-Yung WANG	258
Effects of Strip Thinning Practice on the Properties of Japanese Cedar grown in North-Eastern Taiwan	
Jin-Hau CHEN, Song-Yung WANG and Cheng-Jung LIN	259
Non-Destructive Wood Quality Estimation from Standing Tree in Relation to End Products Characteristics of Fast Growth Plantation Eucalypts in Uruguay (<i>Eucalyptus grandis</i> M.) Sadaaki OHTA, Hugo O'NEILL, Felipe TARIGO and Sebastian QUAGLIOTTI	260
Spiral Grain Development in Plantation Grown White Spruce (<i>Picea glauca</i> (Moench) Voss) **Douglas R. TURNER, Ying Hei CHUI, Shu Yin ZHANG and D. Edwin SWIFT	261

Wood Properties of Sawn Timber of Norway Spruce (<i>Picea abies</i> (L.) Karst.) grown under Wide Spacing	262
Franka BRÜCHERT, Florian M. FRISCH, Stefan PELZ and Udo H. SAUTER Investigating the Effect of Tree Breeding on the Timber Properties of Sitka Spruce	202
J.Paul MCLEAN, Shaun MOCHAN and John MOORE	263
Posters 5.01.06 Effect of Stem Form Factor on Wood Properties of Sugi (<i>Cryptomeria japonica</i>) Plantation Trees - Stem Stiffness, Anatomical Wood Properties and Knot Distribution Yoshio KIJIDANI, Shougo HISAZUMI, Kanichi AMAGASAKI, Satoshi ITO and Ryushi KITAHARA	264
5.03-IRG C – WOOD PROTECTION AND DURABILITY The Role of Global Cooperation in Wood Protection for Conserving Forest Resources Gerard DEROUBAIX and Jeffrey J. MORRELL	265
Recent Developments in Treatment with Borates for Decay and Termite Resistant Framing Jieying WANG, Paul I. MORRIS and Shane MCFARLING	266
Durability of some Alternatives to Preservative-treated Wood Progress Report 2: Results from Field Tests after 5 Years' Exposure <i>Marie-Louise EDLUND and Jöran JERMER</i>	267
Non Pressure Rural Wood Preservation for the Tropics A.A. OTENG-AMOAKO	268
Effect of Cinnamon Oil and Clove Oil against major Fungi Identified from Surface of Rubberwood (<i>Hevea brasiliensis</i>) Narumol MATAN and Nirundorn MATAN	269
Posters 5.03-IRG C Development of Preservative Treatment Method using Sub and Super Critical Carbon Dioxide Myeung-Won CHO, Sung-Mo KANG and Gyu-Hyeok KIM	270
5.04.08 – SAWING, MILLING AND MACHINING Minimizing Fuzziness in the Planing Operation of Rubberwood (Hevea brasiliensis) Jegatheswaran RATNASINGAM and Edward FRANCIS	271
Different Approach for Wear in Wood Cutting <i>P.J. MEAUSOONE, M. GAUVENT, P. MARTIN and P. TRIBOULOT</i>	272
A Characterization of the Small-scale Sawmilling Industry in Nigeria <i>Abel. O. OLORUNNISOLA</i>	273
Inventory Analysis of Particleboard made by Japanese Mills Nobuaki HATTORI, Satoshi TERASHIMA, Keisuke ANDO and Tomiyuki HIMENO	274
Check Detection and Characterization in Veneer qualifying with Use of Digital Image Analysis Bartosz PALUBICKI, Laurent BLERON, Jean-Claude BUTAUD and Rémy MARCHAL	275
Posters 5.04.08 Tool Wear Characteristics of Particleboard made from Empty-Fruit Bunch (EFB) of Oil Palm Jegatheswaran RATNASINGAM and Chew Tek TEE	276
Environmental Friendly Fine Machining Process of Wood Wen-Ching SU, Yiren WANG and Huoh-Jong SHIAU	277
Maximizing Economic Benefits from Curve Sawing in Southern Pine Dimension Lumber Manufacturing H.F. CARINO and C.A. BLANCHE	278
Machinability of Fifteen Major Nigerian Indigenous Hardwoods AWOYEMI, L, OLUJOBI, O. J and FABOYE, O. O	279
Surface Structure induces Quality of Laminated Particleboard Edge during Machining Piotr BEER, Bartosz PALUBICKI, Grzegorz KOWALUK and Waldemar SZYMANSKI	280
State of Lumber Manufacturing Industry in Japan Kohji MURATA, Yuji IKAMI, Kiyohiko FUJIMOTO and Yukari MATSUMURA	281
Evaluating the Impacts of Skill Improvement in Small-scale On-farm Timber Processing in Kenya	

George M. MUTHIKE	282
Automatic Deep Wood Boring System to control Axial Deviation of Holes Takeshi OHUCHI, Hiroko HAMASAKI, Han Chien LIN and Yasuhide MURASE	283
5.07 C – CHEMICALS FROM WOOD	
Ethanol from Wood Cellulose: Economic Realities Howard ROSEN, Ted WEGNER and Peter INCE	284
Determination of Chemical Components of Benzene/Ethanol Extractives of Castanopsis Fissa Leaf by GC/MS	207
PENG Wan-Xi, WU Yi-Qiang, MA Qing-Zhi, ZHANG Dang-Quan and WU Shu-Bin	285
Possibilities of using Dendromass for Energy in the Czech Republic Skoupy ALOIS, Simon JAROSLAV, Klvač RADOMIR and Kulhavy JIRI	286
Fast Pyrolysis of Waste Plastics with Woody Biomass Moon KIM, Philip STEEL, Priyanka BHATTACHARYA, Leonard INGRAM and Charles U. PITTMAN, Jr	287
Pulp & Paper C – MECHANICAL NON-WOOD PULPING Viscoelastic and Microstructural Properties of Novel Cellulosic Gels Reza KORHEI and John KADLA	288
Wood and Fibre properties of Norway Spruce (<i>Picea abies</i>) and Scots Pine (<i>Pinus sylvestris</i>) and their Impact on the Quality of Stone Groundwood Pulp *Götz MARTIN*, Heiner GRUSSENMEYER and Gero BECKER	289
Refiner Mechanical Pulping of Oil Palm Fronds for Newsprint *RUSHDAN Ibrahim, NURUL HUSNA Mohd Hassan, SHARMIZA Adnan, LATIFAH *Jasmani, MOHD. NOR Mohd. Yusoff, MAHMUDIN Saleh and AINUN ZURIATI Mohamed	290
Application of Two Chelating Agents on Bagasse APMP Pulping *Parizad SHEIKHI and Ahmad JAHAN LATIBARI*	291
Effects of Acetylation on the Physical Properties of Paper made from Bagasse <i>Mojtaba SOLTANI</i>	292
5.02 D – MEAUREMENT METHODS INCLUDING NDT / WOOD COMPOSITES AND WOOD PRODUCTS	
Optimal Constitution of Composite LVL Column with Crack-free Surface <i>Ping YANG, Hidefumi YAMAUCHI and Hikaru SASAKI</i>	293
Evaluation of Bending Properties of China Fir Laminae by Nondestructive Testing Method <i>Te-Hsin YANG, Far-Ching LIN, Cheng-Jung LIN and Song-Yung WANG</i>	294
Analysis of MOE and MOR of Bamboo-wood Composite LVL Huanrong LIU and Junliang LIU	295
Measurement of Wood Properties using Digital Cross-cut Images Petri ÖSTERBERG, Heimo IHALAINEN and Risto RITALA	296
Determination of Moisture Content and Specific Gravity of Merchantable Loblolly Pine Logs by near Infrared Spectroscopy Christian MORA, Laurence SCHIMLECK, Alexander CLARK and Richard DANIELS	297
NIR Spectroscopy for Prediction of Radial Variation of Mechanical Properties in Scots Pine Johan LINDEBERG, Daniel ERIKSSON, Tommy MÖRLING and Urban BERGSTEN	298
Posters 5.02 D Measuring Thermo-physical Characteristics of Wood and Wood Based Materials Marian BABIAK, Štefan ŠTELLER and Richard HRČKA	299
Influence of Heat Treatment on Shrinkage / Moisture Content Behaviour of Eucalyptus Woods Giana ALMEIDA, José Otávio BRITO and Patrick PERRE	300
5.03-IRG D – ENVIRONMENTAL ASPECTS IN WOOD PROTECTION A Complete Closed-loop CCA-treated Wood Recycling System	
C. Y. HSE, T. F. SHUPE and R. C. TANG	301

Leachability and Fixation in Treated Kempas Heartwood	
Andrew H.H.WONG and H.C.LAI	302
K _d Values of Cu, Cr, as in different Soil Matrix in Korea Sung-Mo Kang, Seung-Hun Shin and Ja-Oon Koo	303
Supercritical Water Treatment of Creosote-treated Wood Waste <i>T.F. SHUPE and W.J. CATALLO</i>	304
Run-off Quality from Sprinkling Debarked Logs and Logs with Bark of Picea Abies <i>Maria JONSSON</i>	305
Posters 5.03-IRG D	
The Possibility of Timber Plantation Treated with Plastic and CCB for Marine Construction Mohammad MUSLICH, Nurwati HADJIB and KRISDIANTO	306
Evaluating the Process of ACQ-treated Woods with TGA and CEM Analysis Han Chien LIN, Chyi Shiah TSANG and Jung Ting TSAI	307
Influence of Methanol Soluble Extractives on CCA Fixation and Leaching on Malaysian Hardwoods	
H.C. LAI and Andrew H.H.WONG	308
5.05 C – ENVIRONMENTAL IMPACTS AND BENEFITSOF WOOD-BASED COMPOSITE Modeling the Formation and Bonding of Wood Composites Chunping DAI	ES 309
The Detection of Volatile Organic Compounds (eg Formaldehyde) Emissions in Wood Based Materials using Photoacoustic Infrared Spectroscopy Way LONG, Haw Farn LAN, Yaw-Fuh HUANG and Fang-Ming LIN	310
Properties of Multi-layered Kenaf PARIDAH Md. Tahir*, NOR HAFIZAF Hj. Abd. Wahab, AZMI Ibrahim, JALAUDDIN Harun and NOR YUZIAH Mohd Yunus	311
Recycling Economic Development of Wood-based Panel Industry in China Manzhen XIONG, Fucheng BAO, Kelin YE and Xinfang DUAN	312
VOCs of Wood Based Panels in Europe Marius C. BARBU	313
Overlaying Properties of Particleboard Panels made from Eastern Redcedar and Osage Orange Salim HIZIROGLU	314
Low Weight Panels: A New Development in Europe Heiko THOEMEN and Marius BARBU	315
Postsers 5.05 C	
Producing Composite Articleboard from Peanut Husk and Wood-based Materials Wun-Jheng HUANG, Hong-Ding SOONG, Li-Jen HOU and Tien-Tien CHEN	316
Multiple Advanced Reuse of Agroforest Waste from the Used Mushroom Growing Sawdust: Extractive and Lignocellulosic Residue Utilizations	
Yong-Long CHEN, Ho-Chin CHEN, Tsai-Yung CHEN and Jyh-Horng WU Enzymatic Modification of Wood Fibres for Activation their Ability of Self Bonding	317
Cora MÜLLER, M. EURING and A. KHARAZIPOUR	318
Development of Innovative Medium Density Fibreboards (MDF) with Decreased Formaldehyde Emissions	
Christian SCHÖPPER and Alireza KHARAZIPOUR	319
Manufacturing of Wood Particle Oyster-shell Bonded Cement Composites De-Tsai LIN, Chi-Lung CHIANG, You-Lin CHEN, Ru-Jiun LUO, Bei-Shan LIN and Pei-Ling LIU	320
	220
5.06 B – PROPERTIES AND UTILIZATION OF PLANTATION WOOD Improving Utilization and Value Adding of Plantation Timber from Sustainable Forest	
Management Yu Eng TAN, Nigel LIM, James JOSUE and Kee Seng GAN	321

Effects of Moisture Availability on Wood Properties of South African-grown E. grandis Sasha NAIDOO, Anton ZBOŇÁK and Fethi AHMED	322
Alternative Timbers to Iroko (<i>Milicia excelsa</i>) for Various End-uses: Ghana's Offer Samuel AMARTEY and Alhassan ATTAH	323
Wood Properties of <i>Eucalyptus</i> as Indicators to Silviculture and Forest Improvement for Saw Log <i>Jose Nivaldo GARCIA</i>	324
Strength Performance of Glulam made from Obi-sugi Laminae with low Young's Modulus of Elasticity	
A. MATSUMOTO, H. MORITA, Y. FUJIMOTO, A. SHIIBA and Y. IIMURA	325
Physical and Mechanical Properties of <i>Eucalyptus grandis x E. tereticornis</i> Hybrid grown in Argentina Martín SANCHEZ ACOSTA, Martín MARCÓ, Juan Carlos PITER, María Alexandra	
SOSSA ZITTO, Dora INÉS VILLALBA and Luis CARPINETTI	326
Physical and Mechanical Properties of Multiple-leader <i>Acacia crassicarpa</i> A.Cunn.Ex.Benth and <i>Acacia mangium</i> Willd <i>NOR AINI Ab. Shukor*</i> , <i>PARIDAH Md. Tahir</i> , <i>MOHD. FAIZAL Jaafar and ZAINAL</i>	
ABIDIN Ismail	327
5.10 B – MARKETING STRATEGIES & FORCES	
Forest Products Markets in Western European Urbanized Society Nico A. LEEK	328
Value-Focused Forestry in British Columbia: Competitiveness and Sustainability Issues in the	020
Secondary Wood Products Industry Wellington SPETIC, Robert KOZAK and Thomas MANESS	329
Model of Export Marketing Strategies in Transition Countries – the Case of Slovakia <i>Yvonne BRODRECHTOVA, Michel BECKER and Heiner SCHANZ</i>	330
The Relationships among Marketing Forces, Industrial Brand Equity, Industrial Trust and Customer Loyalty: An Empirical Study of Taiwan Lumber Import Market <i>Tse-Wen HSIEH, Tsui-Ying HUANG and Jun-Yen LEE</i>	331
Posters 5.10 B	
Development of a Joined Marketing Concept for Silver Fir in Central Europe Thorsten BEIMGRABEN and Udo Hans SAUTER	332
Types of Export Marketing Strategies - the Case of Forest Products Industries in Slovakia <i>Yvonne BRODRECHTOVA, Michel BECKER and Heiner SCHANZ</i>	333
5.01.07 – TREE RING ANALYSIS	
Metal Deposition in Baldcypress Tree Rings: Nickel, Copper, Chromium, Manganese and Iron <i>Margaret S. DEVALL, Leonard B. THIEN and George C. FLOWERS</i>	334
Identification of Iranian Timber via Cross Sectional Characteristics and with Help of a Computer Program	
Vahid Reza SAFDARI	335
Potentiality and Application of Dendrochronology in Brazil Mario TOMAZELLO F, Fidel A. ROIG, Claudio S. LISI, Paulo C. BOTOSSO, Juliano M. OLIVEIRA and Valério P. PILLAR	336
Posters 5.01.07	
Ring Structures of Chinese Fir and Poplar Plantation Wood Youke ZHAO and Jianxiong LU	337
Climate-tree-growth Relationships of <i>Quercus cerris</i> and <i>Q. pubescens</i> growing in Sympatry in the National Park of Pollino (Basilicata Region, Southern Italy) Luigi TODARO, Laia ANDREU, Paolo CHERUBINI and Antonio SARACINO	338
	220
5.04.12 – SURFACING AND FINISHING Changes in Anatomical, Physical, and Chemical Characteristics of Bamboo during Natural	
Weathering	
Jong Sik KIM, Nam Young KIM and Yoon Soo KIM	339

Weathering Trials of Tropical Timbers Finished with several Exterior Coatings in Japan and Sarawak, Malaysia	•
Makoto KIGUCHI, Yutaka KATAOKA and Kandau JENANG Service Life of Finishes on Smooth-Planed and Saw-Textured Western Redcedar Bevel and Saw	340
Textured Douglas-fir Siding R. Sam WILLIAMS and William C. FEIST	341
Use of near Infra-Red Spectroscopy to Characterize Weathered Wooden Surfaces Martino NEGRI and Anna SANDAK	342
Dyeability of Chemically Treated Wood and Discoloration by Xenon-light Irradiation Yu ZHOU, Ikuho IIDA, Kazuya MINATO, JinLin WANG and Jianxiong LV	343
Posters 5.04.12 A Novel Method for High Resolution Imaging of Coating Distribution within a Rough-textured Plywood Surface Bernard S.W. DAWSON*, Adya P. SINGH, Anni RATZ, Geoffrey DANIEL and Anamika	
SINGH	344
In situ Deposition of Copper Metal in Radiata Pine Bernard SW DAWSON, Tatjana SMOLIC and Adya SINGH	345
Stabilizing Effect of Extractives in the Photodegradation of Wood *Tzu-Cheng CHANG, Hui-Ting CHANG, Chi-Lin WU and Shang-Tzen CHANG*	346
Surface Hardening and Evaluation on the Plantation Softwood <i>LIU Junliang</i>	347
Formation of Conducting Polymers on Wooden Surfaces Bernard SW DAWSON, AP SINGH and RA FRANICH	348
Primer Adherence on Radiata Pine Wood (Pinus radiata D. Don) Sandra FICA, José NAVARRETEY and Ana M. FERNÁNDEZ	349
Tropical Hardwood in outdoor Conditions: Behaviour toward the Colour Durability Martino NEGRI, Barbara TESSADRI and Ignazia CUCCUI	350
Three Dimensional Gloss Measurment on outdoor Weathered Wood <i>Jakub SANDAK and Martino NEGRI</i>	351
5.10 C – CORPORATE RESPONSIBILITY, INNOVATION & PRODUCT DEVELOPMENT Using Consumer Research for Product Development in the Wood Processing Industries Anders Q. NYRUD and Anders ROOS	352
A Proposed Framework for the Diffusion of Corporate Responsibility Practices in the Forestry Sector	552
Natalia VIDAL and Robert KOZAK	353
Measuring Innovativeness in the North American Softwood Sawmilling Industry Chris KNOWLES and Eric HANSEN	354
Wood in the Interior Environment: Subjective Meaning Revealed Using a Non-prescriptive Sorting Methodology Bradley G RIDOUTT, Shuzo SUEYOSHI, Roderick D BALL, Yoshifumi MIYAZAKI and Televici MOBIK AWA	254
Takeshi MORIKAWA Posters 5.10 C	355
Innovation in the Global Forest Sector Eric HANSEN	356
CSR and the US Forest Products Industry: Issues and Stakeholder Views Rajat PANWAR and Eric HANSEN	357
5.12 C – SUSTAINABLE FOREST-BASED NON-TIMBER INDUSTRIES A Synthesis of Biomass Utilization for Bioenergy Production in the Western United States David L. NICHOLLS, Robert A. MONSERUD, Dennis P. DYKSTRA	358
Indonesian Ecotourism: A Prospect of the Non-wood Forest Products Lambok Punguan SAGALA	359
District in Driveta Forests Main Con in Sustainable Forest Management of Moldova	

Vitalie GULCA	360
Posters 5.12 C Ecological Classification System of Forest Landscape in Eastern Mountainous Region of Liaoning Province	
JI Lanzhu, DAI Li-min, ZHAO Liangping, DENG Hongbing and TANG Lina	361
Pulp & Paper D – PAPERMAKING Structure Analyzing and Predicting the Consumption of Fluting Paper Rate in Iran Ajang TAJDINI, Mehran ROOHNIA and Ahmad JAHAN LATIBARI	362
Thermal Paper Recycling Chen-Lung HO, Yu-Chang SU and Eugene I-Chen WANG	363
Biopulping & Pitch Removal: Studies of Fungal Inoculated Wood in Pulp and Paper Operations Roberta L FARRELL, Eugene I. WANG, Cheng-lung HO, Yu-Chang SU, Kuang-ping HSU and Hou-min CHANG	364
Effect of BCTMP Content in Pulp on the Performance of Fluorescent Optical Brightening Agents Yuan-Shing PERNG, Eugene I-Chen WANG, Lan-Sheng KUO, Louise TSAI, Wen-Cheng YANG and Luyen DINH	365
Application of Talc to Calcium Carbonate-containing Paper Coating Formulations <i>Eugene I-Chen WANG, Yuan-Shing PERNG and Wen-Chen YANG</i>	366
Posters Pulp & Paper D Recycling of Carbonless Paper and Laser-printed Paper Chen-Lung HO, Yu-Chang SU and Eugene I-Chen WANG	367
Pulping Characterictics of Blue Stain Fungi and Fungicide Treated Woods Nam-Seok CHO, Yoo-Su SHIN and Soo-Jeong SHIN	368
5.02 E – WOOD COMPOSITES AND WOOD PRODUCTS Characteristics of Bamboo as Fiber Reinforced Material YU Wen-ji and YU Yang-lun	369
The Properties of Mild Steam and Chitosan Treated Ramie and Pineapple Plant Fiber Bundles Sasa Sofyan MUNAWAR, Shuichi KAWAI and Kenji UMEMURA	370
The Influences of Undercuts on the Vibrational Characteristics of Wooden Bars Chih-Lung CHO, Shih-Yin WU, Sheau-Yun YEH and Yeang-Her HWANG	371
Frictional Coefficients between Timber and Other Structural Materials <i>Qingjun MENG, Takuro HIRAI and Akio KOIZUMI</i>	372
Shrinkage/ Swelling Coefficients in Norway Spruce (<i>Picea abies</i> L. Karst) Tissue Types after Impregnation with linseed Oil <i>Thomas ULVCRONA</i>	<i>37</i> 3
5.03-IRG E – INSECT FACTOR IN WOOD PROTECTION Treatment of Green Logs infested by Exotic Pest: Case Study of the Emerald Ash Borer: <i>Agrilus planipennis</i> Fairmaire	
Pascal NZOKOu and D. Pascal KAMDEM	374
Do insects Infest Wood Packing Material with Bark following Heat-treatment? *Robert A. HAACK, Toby R. PETRICE, Pascal NZOKOU and D. Pascal KAMDEM*	375
Potential of some Insecticides as Wood Protectants in South Indian Condition R. SUNDARARAJ, O.K. REMADEVI and Raja MUTHUKRISHNAN	376
FST (Formosan Subterranean Termite) - Resistance of Wood Composite Boards made of Dawn Redwood (Metasequoia glyptostroboides) **R. C. TANG, T. F. SHUPE and C. Y. HSE**	377
Durability of Timber from Exotic Species against Termite Attack in Indian Conditions O. K. REMADEVI and Raja. MUTHUKRISHNAN	378
Development of Boron/Linseed Oil combined Treatment as a Low-toxic Wood Protection: Evaluation of Boron Fixation and Resistance to Termites Florent LYON Marie-France THEVENON Yuji IMAMURA, Joseph GRII, and Antonio	

PIZZI	379
Posters 5.03-IRG Difficulties in Applying Heat Treatment according to ISPM No. 15, when Fast Growth Species are	
used Osvaldo ENCINAS	380
5.05 D – COMPOSITES SCIENCE Dimensional Stability and Mechanical Properties of Particleboard made from Carboxylic Acid Anhydride Modified Bagasse	
Mohammad Reza MASTERY FARAHANI and Mehdi JONOOBI	381
Effects of APP on the Fire-retardant and Mechanical Properties of Wood-flour-HDPE Composite WANG Qing-Wen, SHAO Bo, ZHANG Zhi-Jun and SONG Yong-Ming	382
Properties Enhancement of Palm Plywood through Veneer Pre-treatment with Phenolic Resin LOH Yueh Feng, PARIDAH Md. Tahir, ZAIDON A shaari and NOR YUZIAH Mohd Yunus	383
Feasibility of Manufacturing Paper-plastic Laminates using Waste Paper <i>Chin-Yin HWANG</i>	384
Evaluation of Physical and Mechanical Properties of Cardboard Reinforced with Veneer and High Pressure Laminate (HPL) Nadir AYRILMIS, Zeki CANDAN and Salim HIZIROGLU	385
Assessment of the Flexural Strength and Dimensional Stability of Cement-bonded Boards Manufactured from Maize-cobs and <i>Gmelina arborea</i> Sawdust. Julius B. ADEWOPO and B. AJAYI	386
Posters 5.05 D	
Dimensional Stability of WPC made from Polyester and Wood Particle and Fiber Erhan GOKALP, Mustafa ASLAN, Hulya KALAYCIOGLU and Salim HIZIROGLU	387
Properties of Wood Sawdust/Polypropelyne Composites H'ng Paik SAN, Yeoh Beng HOONG, Teo Seow CHIAN and Yeoh Poh HUN	388
Electrical Properties of Composite Cellulose Material Youki SUZUKI	389
Properties of Composite Panels made from Recycled Office Paper and Plastic Poo CHOW, Charles T. BOWERS, James H. MUEHL and Andrzej M. KRYZSIK	390
Applying High Frequency to Heat Wood-based Panel Evenly *Cheng Jung LIN**	391
Manufacturing and Properties of Wood-plastic Composite Plywood Liang CHANG, Zheng WANG, Li GAO and Wenjing GUO	392
Modifying of Hornbeam Wood (Carpinus betulus L.) by Hot Pressing Mohsen SAFFARI	393
The Effect of Door Leaf Constructions on Fire Endurance of Wood-based Fire Doors Sheau Horng LIN and Quan Zhen JI	394
Manufacture of Wood-pottery Composite Board Andi HERMAWAN, Takeshi OHUCHI, Noboru FUJIMOTo and Yasuhide MURASE	395
Manufacture of Agroforest Waste Particle-plastic Composites and its Properties Chih-Feng YEH, Tung-Lin WU, Ho-Chin CHEN, Chun-Hsiung HSU, Jyh-Horng WU and Tsai-Yung CHEN	396
5.07 D – CHEMICALS FROM WOOD Thermo-chemical Conversion of Wood Biomass <i>Populus alba</i> × <i>gradulosa</i> to Monomeric Sugars by Supercritical Water Treatment in Presence of Inorganic Acid Catalysts *Don-Ha CHOI, Tae-Su CHO, Joon Weon CHOI, Hyun Jin LIM and Kyu Sung HAN	397
Bundling of Slash Material - The Answer for an efficient Energywood Supply Chain in Central Europe?	
Hannes LECHNER and Gero BECKER Province Solve Comp. Names of Comp. (Prov. 1) and 11 (11) (12)	398
Resin Salve from Norway Spruce (<i>Picea abies</i> [l.] Karst.) Pekka SARANPÄÄ, Tapio LAAKSO, Maija TIKKANEN, Arno SIPPONEN, Merja RAUTIO,	

Janne J. JOKINEN and Jouni LOHI	399
Charcoal from Biomass Residues of a <i>Cryptomeria</i> Plantation and its Carbon Fixation Benefit Analysis	
Yu-Jen LIN and Gwo-Shyong HWANG	400
Fuel Value of Wood Residue and Charcoal Briquettes Joseph Adeola FUWAPE	401
Investigation of Transformation Mechanism from Wood to Charcoal at Elevated Temperature Sung-Min KWON and Nam-Hun KIM	402
5.11 B – NON-WOOD FOREST PRODUCTS-ALTERNATIVE FOREST PRODUCTS FOR A SUSTAINABLE FUTURE The Role of Indigenous Fruit Trees in Food Security and Dietary Diversity for Pastoralists in the Borana Rangelands, Oromia, Ethiopia Abebe YADESSA, Mohammed ADILO and Dechasa JIRU	403
The Changing Structure of the Philippine Non-wood Furniture and Handicraft Industries: Marketing, Trade and Policy Implications Isabelita M. PABUAYON	404
In vitro Clonal Propagation of Crataeva magna (Lour.) DC, a Tree of Medicinal Importance Nishritha BOPANA and Sanjay SAXENA	405
Socio-economic Importance of Main Non-wood Forest Products Collection and Use for Inhabitants in the Czech Republic <i>Ludek SISAK</i>	406
MAPs for Biodiversity Conservation and Poverty Reduction: Case Studies from South Asia <i>R.B.S. RAWAT, N. BHATTARAI and D. CHOUDHARY</i>	407
Posters 5.11 B	
Marketing of Anahaw (<i>Livistona rotundifolia</i>) Fans in selected Sites of Quezon Province, Philippines **Arsenio B. ELLA and Anie C. MERIDA*	408
	400
Impact of the Distribution of Commercialization Raw Margins on the Harvested Medicinal Plant in Benin Fifanou VODOUHE, Brice SINSIN and Ousmane COULIBALY	409
Effect of Finger Joints on the Flexural Properties of Glued Laminated Bamboo Member Min-Chyuan YEH and Yu-Li LIN	410
Impregnation of Bamboo Strips with Low Molecular Weight Phenol Formaldehyde Resin: Impregnation and Drying Process MOHD. JKHAIRUN Anwar Uyup, PARIDAH Md. Tahir, HAMDAN Husain, MOHD SAPUAN Salit and ZAIDON Ashaari	411
Marketing of Non-timber Forest Products: A Case Study of Tumrakheda Village in Raisen District of Madhya Pradesh, India. Manish MISHRA and Teki SURAYA	412
Composition and Bioactivities of the Leaf Essential oils of <i>Cinnamomum subavenium</i> Miq. from Taiwan	
Chen-Lung HO, Yu-Chang SU and Eugene I-Chen WANG	413
Regional Initiatives for Sustainable Non Wood Forest Products Management in South Asia <i>A. A. BOAZ</i>	414
Anti-cancer Activity of Antrodia cinnamomea, Ganderma lucidum and Auricularia polytricha Yih-Hsin CHANG, Yue-Ken LIAO, Ming-Yuh SHIAU and Shih-Hao LEE	415
AUTHOR INDEX	416