

PREFACE

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This volume is a proceeding of the 16th International Conference for Renewable Resources and Plant Biotechnology (NAROSSA® 2010).

NAROSSA® 2010 conference was held in Maritim Hotel (Magdeburg, Germany) in the period June 7 – 8, 2010. The organizers of conference were the association Pilot Pflanzenöltechnologie Magdeburg e. V. (PPM) and the sponsor of this conference was OHMI Consulting GmbH.

Prof. Dr. Melvyn F. Askew (Census, Wolverhampton, United Kingdom), Prof. Dr. Grete Bach (ifn Forschungs- und Technologiezentrum GmbH, Elsteraue/OT Tröglitz, Germany), Dr. Ute Bauermeister (Gesellschaft für Nachhaltige Stoffnutzung mbH, Halle/Saale, Germany), Dr. Peter Bloß (Kunststoff-Zentrum in Leipzig gGmbH, Leipzig, Germany), Dieter Bockey (UFOP e.V., Berlin, Germany), Dr. Susanne Brandt (Landesbauernverband Sachsen-Anhalt e.V., Magdeburg, Germany), Thorsten Breitschuh (NAROSSA e.V., Magdeburg, Germany), Dr. Waldemar Buchwald (Institute for Natural Fibres and Medicinal Plants, Poznan, Poland), Dr. Matthias Gohla (Fraunhofer IFF - Institut für Fabrikbetrieb und -automatisierung, Magdeburg, Germany), Torsten Graf (Thüringer Landesanstalt für Landwirtschaft, Dornburg, Germany), PhD Paul P. Kolodziejczyk (Biolink Consultancy, New Denver, Canada), Prof. Gotthard Kunze (Leibniz-Institut für Pflanzengenetik und Kulturpflanzenforschung IPK, Gatersleben, Germany), Prof. Dr. Lothar Mörl (Otto-von-Guericke-Universität, Magdeburg, Germany), Prof. Dr. Ingo Schellenberg (Hochschule Anhalt (FH), Kompetenzzentrum Life Sciences, Bernburg, Germany), Dr. Heike Schimpf (Landesanstalt für Landwirtschaft, Forsten und Gartenbau / KoNaRo, Bernburg, Germany), Prof. Grzegorz Spychalski (Institute for Natural Fibres and Medicinal Plants, Poznan, Poland), Dr. Ralph Thomann (Institut für Getreideverarbeitung GmbH, Bergholz-Rehbrücke, Germany), Dr. Maria Wladyka-Przybylak (Institute for Natural Fibres and Medicinal Plants,

Poznan, Poland), Prof. Dr. Gennady E. Zaikov (N. M. Emanuel Institute of Biochemical Physics, Moscow, Russia) were members of Scientific Committee of this conference.

The program of the conference included follow main topics:

1. Plant Breeding for non-food Application
 - Biotechnology
 - In vitro culture
 - Smart breeding
2. Renewable Resources for Material Applications
 - Biobased composites (Natural fibres, Nano particles etc.)
 - Biobased polymers
 - Biobased additives
3. Processing, Characterisation and Application of Secondary Plant Metabolites
 - Biomass conversion technologies
 - Biorefineries
 - Cosmetics and pharmaceuticals
4. Biomass and Efficient Energy Generation
 - Energy crops and organic residues
 - Thermal, thermochemical and biochemical conversion technologies
 - Gas cleaning and product upgrading
5. Sustainable Development in Environment, Economy and Sociology
 - Acceptance
 - Sustainability in production and logistics
 - Regional material, nutrient and energetic cycles

About 100 participants from 27 research centers from Germany, France, Russia, Poland, Switzerland, Czech Republic, Guinea, Indonesia took part in this conference.

Scientific program of the conference included 3 plenary lectures and 33 oral presentations which were divided on two sessions.

The topic of first plenary lecture was "Greeting of the patron" (H. O. Aeikens, Minister for Agriculture and the Environment of Saxony-Anhalt, Magdeburg, Germany). The second plenary lecture was about feedstocks and (bio) technologies for biorefineries (J. Venus, Leibniz-Institut für Agrartechnik Potsdam-Bornim e.V., Germany). Socially sustainable development of the rural areas was discussed in the third lecture (G. Sychalski, Director of the Institute of Natural Fibres and Medicinal Plants, Poland).

The first session of conference had 18 oral presentations. P. Gerth, T. Bagus, M. Poschke, J. Zimprich (Centre of Competence Engineering Sciences/Renewable Materials, University of Applied Sciences, Magdeburg, Germany) spoke about biomaterials for consumer products. A. Breier, K. Gliesche, P. Govindarajulu, C. Rentsch, B. Rentsch

(Leibniz-Institut für Polymerforschung Dresden e.V., Germany; Universitätsklinikum Carl-Gustav-Carus, TU Dresden, Germany; Fa. Catgut GmbH, Markneukirchen, Germany) gave presentation about tissue engineering executed on textile scaffolds embroidered with degradable surgical thread materials. The lecture of M.I. Artsis, A.P. Bonartsev, A.L. Iordanskii, G.A. Bonartseva, G. E. Zaikov (General Institute of Chemical Physics, Russian Academy of Sciences, Moscow, Russia; A.N. Bachs Institute of Biochemistry, Russian Academy of Sciences, Moscow, Russia; Faculty of Biology, Moscow State University, Moscow, Russia) was devoted to biodegradation and medical application of microbial poly(3-hydroxybutyrate). The results about flammability of polymeres reinforced with lignocellulosis raw materials was included in the talk of M. Wladyka-Przybylak, K. Bujnowicz (Institute of Natural Fibres and Medicinal Plants, Poznan, Poland). J.-P. Krause (Institute of Nutrition Science, University of Potsdam, Germany) spoke about correlations between interfacial rheology and film forming behaviour of plant proteins.

The lecture of P. L. Mikolajczak, A. Bogacz, M. Karasiewicz, P. M. Mrozikiewicz (Dep. of Pharmacology and Biotechnology, Institute of Natural Fibres and Medicinal Plants, Poznan, Poland; Dep. of Pharmacology; Laboratory of Experimental Pharmacogenetics, Dep. of Clinical Pharmacy and Biopharmacy Poznan University of Medical Science, Poznan, Poland) was devoted to role of puerarin and daidzin as secondary plant metabolites - study on alcoholism. The information about PCR-based detection endophytic bacteria appearing in *in vitro* cultures of different clones of *Urtica dioica* L. using specific PCR-primers, derived from bacterial 16S rDNA sequences was included in the lecture of C. Schneider, B.Eng. Sven Wartenberg, B.Eng. Jasmin Dufrenne, B. Biskupek-Korell (Institut für Pflanzenkultur e.K., Schnega, Germany; FH Hannover, Fakultät 2, Abt. Bioverfahrenstechnik, Germany). M. Chudy, G. Mankowska (Dep. of Hemp Breeding, Agronomy and Seed Production; Dep. of Biotechnology both: Institute of Natural Fibres and Medicinal Plants, Poznan, Poland) spoke about genetic resources of *Cannabis sativa* L. in the collection of the gene bank at INF&MP in Poznan.

The lecture of B. Biskupek-Korell, S. Becker, J. Dufrenne, P. Rauscher, C. Schneider (FH Hannover, Fakultät 2, Abt. Bioverfahrenstechnik, Hannover, Germany; Institut für Pflanzenkultur e.K., Schnega, Germany) was devoted DNA fingerprinting and characterisation of genetic variation of different clones of *Urtica dioica* L. via RAPD and RAPD-derived SCAR markers. The problems of detection of phytopathogenic RNA-viruses were discussed by K. Florschütz, A. Schröter, M. Körner, G. Kunze (Leibniz-Institute of Plant Genetics and Crop Plant Research (IPK), Gatersleben, Germany). M. Strybe, N. Kryszak (Dep. of Hemp Breeding, Agronomy and Seed Production; Harvesting Technology and Fibre Plants Evaluation Dep.; Institute of Natural Fibres and Medicinal Plants, Poznan, Poland) spoke about the effect of harvesting time on cellulose content in fibrous hemp.

The application of biotechnology in flax and hemp breeding was discussed by K. Wielgus, A. Luwanska, G. Mankowska, J. Przewozna (Department of Biotechnology, both: Institute of Natural Fibres and Medicinal Plants, Poznan, Poland).

Five last oral lectures were devoted to the next problems: public acceptance of biomass power plants – results of recent environmental psychological surveys (J. Zoellner, P. Schweizer-Ries, I. Rau, Institut für Psychologie, FG Umweltpsychologie, Otto-von-Guericke-Universität Magdeburg, Germany); regional value added of bioenergy activities: a material flow approach (R. Offermann, T. Seidenberger, D. Thrän, DBFZ German Biomass Research Centre, Leipzig, Germany); sustainable intra-logistics with renewable energies and fuel cells

(H. Zadek, R. Schulz, Institute of Logistics and Material Handling Systems, University "Otto-von-Guericke", Magdeburg, Germany); prevention of disposal of greenhouse gases from digested residues by optimal use of the nitrogen fertilizer potential (U. Bauermeister, GNS Gesellschaft für Nachhaltige Stoffnutzung mbH und BMVerfahrenstechnologie, Halle/Saale, Germany); criteria system of sustainable agriculture (CSSA-KSNL) (G. Breitschuh, H. Eckert, I. Matthes, J. Strümpfel, G. Bachmann, T. Breitschuh, Thuringian Ministry for agriculture and environment, Erfurt, Germany; Thuringian state institute for agriculture, Jena, Germany; VAVB e.V., Jena, Germany).

The second session of conference had 15 oral presentations. R. Thomann, C. Luft, S. Icking, H. Hiob, R. Schneeweiß (Institut für Lebensmittel und Umweltforschung e.V., Nuthetal, Germany; Görlitzer Kornbrennerei und Spirituosenfabrik, Seyda, Germany; Institut für Getreideverarbeitung GmbH (IGV), Nuthetal, Germany) gave presentation about economical and ecological aspects in the production of ethanol from grain with the use of roller mills. M. Seiffert, F. Langer, F. Scholwin (German Biomass Research Centre, Leipzig, Germany) spoke about provision pathway for biomethane. The title of presentation of R. Pätz (Hochschule Anhalt, Germany) was "Simple kinetics of methane formation using model substrates". The lecture of D. Backofen, M. Adam, H. Tschöke, M. Könnig, J. Schmidt (Institute of Mobile Systems; Institute of Fluid Dynamics and Thermodynamics; Otto-von-Guericke-University, Magdeburg, Germany) was devoted to spray formation of alternative Diesel fuels under engine-like conditions. The information about energetic efficiency of four arable crop species was presented by J. Kolodziej, J. Pudielko, J. Mankowski (Institute of Natural Fibres and Medicinal Plants, Poznan, Poland) and the information about the potential of Sorghum varieties as bioenergy crops was included in the presentation of A. Hartmann, K. Zeise, M. Fritz (Technologie- und Förderzentrum Straubing / Sachgebiet Rohstoffpflanzen und Stoffflüsse, Straubing, Germany).

Multiscale metabolic modeling: an integrative systems biology approach for biomass research was discussed in the lecture of M.-R. Hajirezaci, M. R. Ghaffari, R. Lemke, B. H. Junker, J. Müller, B. Usadel, R. Wünschiers, F. Schreiber (Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), Gatersleben, Germany; SunGene GmbH, a BASF Plant Science Company, Gatersleben, Germany; Martin-Luther-Universität Halle-Wittenberg, Yield and Ecophysiology, Halle/Saale, Germany; Max-Planck-Institute for Molecular Plant Physiology, Integrative Carbon Biology, Golm, Germany). M. Ernst, M. Ouzonova, T. Presterl, P. Westhoff, R. Meyer, A. Melchinger, J. M. Montes, C. Riedelsheimer, C. Grieder, J. Selbig, A. Larhlimi, M. Stitt, R. Sulpice, A. Czedik-Eysenberg, L. Willmitzer, T. Altmann (Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), Gatersleben, Germany; KWS Saat AG, Einbeck, Germany; Heinrich-Heine-Universität Düsseldorf, Germany; Universität Hohenheim, Germany; Universität Potsdam, Germany; Max-Planck-Institut für molekulare Pflanzenphysiologie, Golm, Germany) spoke about structural genomic research for energy maize. The problems of agricultural residues as a renewable source of bio-energy with special focus on cereal straws were discussed by S. Narra, C. Glaser, P. Ay, H.-J. Gusovius, C. Stollberg (Chair of Mineral Processing, Brandenburg University of Technology, Cottbus; Leibniz Institute for Agricultural Engineering Potsdam-Bornim, Germany; Process Technology of Biogenous Resources, Faculty of Engineering, University of Applied Sciences Wismar, Poel, Germany). M. Lochynska, G. Oleszak (Dep. of Silkworms Breeding and Mulberry Cultivation; Experimental Farm in Petkow; Institute of Natural Fibres and

Medicinal Plants, Poznan, Poland) discussed the problems of multi-use of the white mulberry (*Morus alba* L.).

G. Fleck, N. Stadermann (Pilot Pflanzenöltechnologie Magdeburg e.V., Germany; Maschinenfabrik Reinartz, Neuss, Germany) gave presentation under the title "Technology development of decentralized processing of *Jatropha*-seeds". The lecture of S. Traoré, A. Diarra, M. Traoré, S. Magassouba (Polytechnic Institute, University of Conakry, Guinea; FSE, Dep. of Economics, University of Sonfonia, Conakry, Guinea; Institute of medical plants, Dubreka, Guinea) was devoted to survey of *Jatropha curcas* energy potential for an efficient production of biodiesel as renewable resource. The information about non-food crops as a feedstock for modern bio-based industry was included in the lecture of K. Heller, M. Mackiewicz-Talarczyk, P. Baraniecki (Institute of Natural Fibres and Medicinal Plants, Poznan, Poland).

The last oral presentations were devoted to the next problems: oilseed Bbio-refinery – a new concept of value-added processing (F. Pudel, Pilot Pflanzenöltechnologie Magdeburg e.V., Germany); evaluation of different fractionation methods for the extraction of pure fatty acids (M. Rohrbeck, Pilot Pflanzenöltechnologie Magdeburg e.V., Germany); IFT Performance of MES surfactant from Palm Olein for EOR application (E. Hambali Surfactant and Bioenergy Research Center, Bogor Agricultural University, Indonesia); the development of Palm Methyl Ester Sulfonic Acid (MESA) to increase oil well recovery (S. Mujdalipah, E. Hambali, E. Zulchaidir (Surfactant and Bioenergy Research Center, Bogor Agricultural University, Indonesia; PT. Findeco Jaya, Pulogadung, Jakarta).

Poster session included 17 presentations about some aspects of plant biotechnology and renewable resources. Particularly there was the poster of Russian scientists: "Mechanism of stable radical generation in lignin under the action of nitrogen dioxide" (E. Ya. Davydov, I. S. Gaponova, S. M. Lomakin, G. B. Pariiskii, T. V. Pokholok, Gennadi E. Zaikov, N.M. Emanuel Institute of Biochemical Physics, Russian Academy of Sciences, Moscow, Russia).

The problems which were discussed during this conference are very important for pure as well as for practical application.

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