

Summary of 5th International conference on Polysaccharides-Glycoscience 2009

The 5th International conference on Polysaccharides-Glycoscience 2009 took place from the 11th to 13th November, this time with the support of ESF „EuroGlycoScience Forum“. The conference became one of the activities of the new grouping, Euroglycoscience Forum and the organization Euchems. The organizers of the conference were the Czech Chemical Society and the Department of Carbohydrate Chemistry and Technology of the Institute of Chemical Technology, Prague. The Euroglycoscience Forum was presented with the poster, during the opening speech of Prof. Čopíková and each participant obtained leaflets about activities and importance of this organization.

Oral presentations were divided into the following categories (sections):

1. Physical effects of natural polysaccharides (naturally occurring polysaccharides) (chairperson- Prof. Jana Čopíková)
2. Isolation, characterisation and analysis of polysaccharides (chairman-Dr. Jan Hirsch)
3. Physical properties and ageing of polysaccharide-derived materials (chairman- Prof. Krzysztof Surówka)
4. Utilising Image analysis (chairman- Prof. Zdeněk Bubník)
5. Starch, pectin- chemistry, technology and usage (chairman- Ing. Evžen Šárka)

Of particular interest in the 1st category (section) of presentations was Prof. Větvička's lecture. The lecture touched on the medical and immunological aspects and the usage of β -glucans on the one hand, and the deliberate factual misrepresentation of the levels of β -glucans in commercial products on the second hand.

Equally interesting was another plenary lecture delivered by Prof. Praznik from The University of Natural Sciences and Applied Biology in Vienna. Prof. Praznik mainly focussed on the size determination of water-soluble polysaccharide macromolecules and their structural characterization using relevant chromatographic techniques with different detection systems.

Not least interesting was a lecture by associate Prof. Duchek from the University of West Bohemia. His lecture concentrated on the effects of ageing on the qualities of nano-composite starch-clay materials.

The key lecture in section 4. was delivered by Dr. Venora of the Sicily Grain Research Station (Stazione Sperimentale di Granicoltura, via G. Rosini, Caltagirone, Italy) who concentrated on the identification of grains(seeds) with the aid of image analysis and linear discrimination analysis.

All in all, 19 lectures and 42 posters were presented at the conference. Due to a 25 % increase of participants in the poster section, it had to be divided into two parts. Authors were from Italy, Poland, Austria, Slovakia, The USA and The Czech Republic respectively. The number of participants, 85 (10 delegates more than last year) justified the extension of the conference by a day longer. All abstracts are published in Listy cukrovarnické No 9, p. 755-782 (2009), they will be published in Staerke/Starch in 2010 and full texts are copied on CD Rom with ISBN 978-80-86238-72-2.

The scientific gathering was complemented by a rich cultural program- a visit to the Clementinum which included a bird's eye-view of the magic panorama of night Prague as viewed from the Astronomical tower. Worthwhile was a visit to the baroque library hall richly furnished with antique geographical and astronomical globes and books dating back to the 17th century. The program was concluded by an enviable visit to the mirror chapel.

The conference was supported financially by ESF EuroGlycoScience Forum and Czech companies or Czech branches of international companies, i.e. Laboratory Imaging Ltd, Thermo Scientific (Nicolet cz.), Ecom Ltd., Maneko Ltd., SciTech Ltd., and Ingos Ltd.

Description of the scientific content of and discussion at the event

The first part of the conference dealt with physico-biological effects of natural polysaccharides.

The main lecture of Prof. Vetvicka "Glucan – magic bullet or con?" was focused on β -glucan. Experiments done by the University of Louisville research group demonstrated that the CR3 receptor is primarily responsible for both the binding and biological effects of glucans. CR3 is considered to be the most important receptor mediating clearance of opsonized immune complexes by the phagocytic system. Knowledge of the route glucan takes to get into all organs of human body is still limited. The hypothesis is that so called M cells in the gastrointestinal tract and macrophages in the Payer's paths of the gut, bind and subsequently internalize soluble or particulate glucan,

Once the glucan is inside the cells, the slow process of digestion occurs, resulting in producing smaller glucan fragments. These fragments are later released and subsequently bound by other macrophages. Experiments showed that phagocytosed glucan was slowly degraded within cells and that soluble biologically highly-active fragments of glucans were released into surrounding cells. Prof. Vetvicka pointed that glucan has beneficial effects, as cancer treatment, stimulation of cellular and humoral immunity, bone marrow support, anti-stress effects, lowering blood sugar and cholesterol, suppression of mercury poisoning, etc. Nevertheless the attention must be paid to commercial products. The laboratory experiments showed that these products differ in the content of glucan and its purity and activity. The procedure of isolation and methods of determination can be the main reason of these results.

The two next lectures of Dr. Haverlentova and Prof. Loeppert were focused on biological properties of wheat β -D-glucan and fructans. Dr. Haverlentová explained the beneficial properties of cereal glucans and its content in wheat cultivars planted in Slovakia and infected with fungi *Fusarium culmorum* SACC. Prof Loeppert explained the health promoting effects of fructo-oligo- and polysaccharides for the human body. Fructans are soluble non-digestible carbohydrates promoting formation of microflora population in colon system with healthy bifidogenic effects (prebiotics). Additionally, they interfere with glucidic and lipid metabolism and the facilitation of mineral absorption.

Discussion: After Prof. Vetvicka lecture discussion took place concerning practical application of glucan in medicine, as well as general future of natural immunomodulators. The next broadly discussed paper of R. Löppert and colleagues was named "Fructans: occurrence, structure and healthy properties." Again, many requests for information of perspective medicinal and dietary applications of fructans were placed.

The second part of the conference dealt with isolation, characterisation and analyses of polysaccharides

The comprehensive lecture of the Prof. Praznik et al. "Molecular dimension and structure of water soluble polysaccharides by means of adequate chromatographic techniques with different detection systems" was focused on molecular characterisation of polysaccharides. Prof. Praznik pointed out that a chance to separate polysaccharide fractions due to differences in component mean-dimensions is entropy-controlled size-exclusion

chromatography (SEC). Interpretation of SEC separated polysaccharide characteristics based on on-line detected elution profiles of mass, scattering and viscosity provides absolute information about dimension and conformation distributions. A new approach for particular glucans being independent on supermolecular structures - quantitative labelling of the unique terminal hemiacetal groups on each glucan molecule combined with determination of mass and molar glucan concentrations – was developed and provides information on de facto molecular dimensions of individual glucans. In this case SEC-separation with mass detection (refractive index) and molar detection (fluorescence of labelled hemiacetals) is applied. Prof. Praznik presented his research on long-chain branched (lcb)-glucans (native amylose), short-chain branched (scb) glucans (amylopectin), fructans and plant gums.

Discussion developed on the experience of Prof. Praznik laboratory with FD (labelling technique) and combination of LALLS and DRI detectors in SEC of polysaccharides.

The lecture of Prof. Praznik was followed with forth lectures on characterization of chitinous polyaminoglycosides (Dr. Tiščenko, et al.), the multivariate analysis of vibrational spectra of wood mushrooms (Ing. G.Gomba, et al.), isolation and characterization of cereal arabinoxylans.

Discussion developed on results of different spectroscopic techniques CP MAS ¹³C NMR, MALDI TOF MS and FTIR applied on polysaccharides.

The third part of the conference was about physical properties and ageing of polysaccharide-derived materials

Prof Milichovský et al. presented study on aging of ligno-cellulosic materials materials which is connected with recycling, secondary fibres, paper recovery, preservation and conservation of culture heritage on wood and paper basis etc. are connected with aging of like paper and other cellulosic products. Information was based on experimental observations by help of synchrotron X-ray microtomography, thermal techniques, chemi-luminescence and EPR techniques but predominantly UV-VIS spectroscopy of oxidised cellulose solution accompanied with appropriate chemical analysis. A specific role during aging plays the light-sensitivity of lignin causing the low photo-stability and material discolouration. However, due to structures of lignin compounds corresponding to the hindered phenols, lignin can act as effective antioxidants capable to scavenge reactive radical intermediates. The detailed knowledge of nitroxide-mediated oxidation of cellulose including its degradation and destruction has helped to better understanding of cellulose material aging because oxides of nitrogen pollute the air.

Next two lectures authors presented results mechanical analysis applied on thermoplastic cationized starches and sodium montmorillonite (Prof. Duchek, et al.) and potato cortex tissue of 5 cultivars (Ing. Lahodová, et al.). The potato tissue expresses similar temperature dependent deformation as the extracted starch. Dynamic mechanical analysis applied to the potato tissue indicates either gelatinization or pasting starch processes similarly as the extracted starch. The starch pasting is the strongest process indicated in a potato cellular structure during its heating.

Discussion developed on the evaluation of polysaccharides aging by mechanical and physical method.

The forth part was about utilising Image analysis in characterization of polysaccharide materials

Prof. Venora et al. had the keynote on application of Image analysis in classification of seed containing polysaccharides. He explained the advantage of IA in identifying and classifying seeds. He presented results with applying IA in analysis of grain legumes such as lentils (*Lens culinaris Medik.*), landraces of bean (*Phaseolus vulgaris L.*) from different region of Italy and in identification of cultivar *Vicia sativa L.* (common vetch). Digital images acquired by a flatbed scanner of ex situ germplasm stored in a Germplasm Bank were used. The analysed accessions refer to 148 taxonomic units belonging to 102 genera and 47 families, typical of the Mediterranean flora. This method allowed carrying out a database for the characterization of autochthonous germplasm in entry to the bank and the realization of statistic classifiers for the discrimination of genera and species. The proportion of vitreous kernels in a sample is an internationally recognized specification for determining the value of durum wheat (*Triticum durum Desf.*). Vitreous kernels are mostly related to quality, which affects the pasta performance during cooking. Vitreousness and the amount of shrunken kernels are visually assessed during the grading process. The image analysis system proved to be more reliable than the human inspectors who validated the system, both for the same samples measured many times and at different times⁵.

Image analysis (Dr. Šárka et al.) was applied in starch industry for surface and volume models of wheat, barley and legume seeds, identification of native or modified starches. A geometric model based on image analysis measurement, consisting of two cone frustums provided the best approximation of volume for a barley kernel, and on the other hand geometry of wheat kernels⁴ and most of bean varieties allowed to be well modelled as triaxial ellipsoid. Two sphere segments approximation was more suitable in the volume computation of both red and green lentils than oblate sphere approximation. Identification of native or modified starch powders or suspensions is based on determined size distribution and comparison with known samples.

The light microscopy (Dr. Dvořáček et al.) :with subsequent image analysis was used for characterization of starch granules in two model doubled haploid wheat lines (*Triticum aestivum L.*) differing in the presence or the absence of 1B/1R rye translocation. There were analyzed more than 12 000 starch granules of each sample and verified an optimal number of starch granules for obtaining of representative results about size and shape distribution of starch granules. The typical bimodal starch distribution in the wheat samples was confirmed. In spite of high genetic similarity between the both lines there were detected the significantly higher value of circularity in the translocated wheat line (L110) and the trend of higher diameter average of starch granules in the wheat line (L159) characterized by the absence of 1B/1R translocation.

Dr. Smýkalová et al. showed results with seed type identification by Imagine analysis and presented correlation their nutrition value with size, shape and colour characteristic.

Discussion developed on the widere use of Image analysis, compliance with reference or other methods and applied software in evaluation of agglomerates.

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The fifth part of the conference Starch, pectin- chemistry, technology and usage was focused on importance of polysaccharides in technology.

One of the criteria specific in the process of evaluation the quality of cane sugar is the content of starch (Dr. Wojczak et al.). The presence of starch in raw sugar results in an increase of juice viscosity, which leads to lowering of the effectiveness of juice filtration and to poorer results of the processes of purification and decolorization⁴. Besides, the presence of starch is an obstacle in the process of crystallization. The aim of the present lecturer was to determine the content of starch in cane sugar of different origins by the ICUMSA method GS1-17. This method measures starch in sugar as a blue starch-iodine complex. The determination of the content of starch may be treated as a one of the indicators differentiating white cane sugar from beet sugar, which contains no starch. The content of starch in refined cane sugar should be an important criterion of the quality of sugar as raw material for various branches of food industry.

Starch is the favorite pore-forming agents for the preparation of porous ceramics (Dr. Živcová et al). Rheology, swelling behavior and the resulting pore space of rice starch was presented in the lecture.

Dr. Kováčová et al. presented the influence of addition of different types of pectins on thermal denaturation of whey proteins which was observed by both dynamic light scattering (DLS) and differential scanning calorimetry (DSC). The addition of high esterified pectin successfully prevent to huge aggregation at denaturation temperatures of pure β -lactoglobulin as well as proteins in rennet whey. The DSC was used for characterization of differences in thermodynamic behavior of whey proteins in presence of structurally different pectins.

Discussion concerned the cane raw sugar imports to Poland, detection of cane raw sugar. Next part discussion was about the explanation of the high esterified pectin influence on aggregation of milk proteins.

Assessment of the results and impact of the event on the future direction on the field

Carbohydrates, proteins and nucleic acids are the fundamental components of all living organisms. As such Glycoscience is the basic discipline and the principle idea of all Polysaccharides conferences. The 5th International conference on Polysaccharides followed previous events whose aim was to gather experts and scientists working in this field.

The conference is smaller in number of participants (about 80) which has three advantages. Firstly, the conference topics are limited and focused on the selection of scientific issues and therefore brings together people with similar interest of research. Participants appreciated the possibility to easily discuss their scientific or more practical problems with deeply experienced researchers. Secondly, the participants fee 1500/1800 Kč (65/78 EUR) allows the opportunity to attend the conference for students or young scientists. Finally, it can be appreciated that time span of the three-day conference is convenient for hard working scientists. The success of the conference is thanks to the sacrificial and voluntary activities of the scientific and the organizing committees.

Participants of the conference were enabled to get new knowledge from glycoscience, about biological properties of polysaccharides, comprehensive methods of their analysis, new application of physico-mechanical methods in characterisation of polysaccharides.

Organizers of the next conference, 6th International Conference on Polysaccharides-Glycoscience, are considering in-depth incorporation of areas such as biological and immunological properties of polysaccharides and further diversify the section with a topic on derivatives of polysaccharides with medicinal and ecological significance.

Final program

**5th International Conference on
POLYSACCHARIDES-GLYCOSCIENCE**

11-13 November, 2009

**Novotného lávka 5,
Prague, Czech Republic**



Czech Chemical Society



**INSTITUTE OF
CHEMICAL TECHNOLOGY
PRAGUE**



ESF EuroGlycoSciences Forum
Research Network Programme



European Association for Chemical and Molecular Sciences

11 November, 2009

16:00 – 18:00 Registration, Conference Opening (glass of wine)

VINOGRAPH - Enosfera s.r.o.
Míšeňská 68/8
118 00 PRAGUE 1 - Malá Strana

12 November, 2009

08:00 – 09:00 Registration

Novotného lávka 5
116 68 PRAGUE 1

Oral session

09:00 WELCOME
JANA ČOPIKOVÁ, *Institute of Chemical Technology in Prague, Czech Republic*

09:10 – 10:20 Oral session 1 “PHYSIOLOGICAL EFFECTS OF NATURAL POLYSACCHARIDES”
chairwoman: **Jana Čopíková**

09:10 – 09:50 Keynote lecture: GLUCAN - MAGIC BULLET OR BIG CON?
V. Větvička
Department of Pathology, University of Louisville, Louisville, Kentucky, USA
vaclav.vetvicka@louisville.edu

09:50 – 10:05 ANALYSIS OF MIXED-LINKED (1→3)(1→4)-β-D-GLUCAN IN WHEAT CULTIVARS (*TRITICUM AESTIVUM* L.) AND POSSIBILITIES OF ITS UTILIZATION
M. Havrlentová, S. Šliková, V. Šudyová, P. Hauptvogel, A. Burgárová
Slovak Agricultural Research Centre-Research Institute of Plant Production Piešťany, Slovak Republic; Department of Nutrition and Food Evaluation, Faculty of Chemistry and Food Technology, Slovak University of Technology Bratislava, Slovak Republic.
havrlentova@vurv.sk

10:05 – 10:20 FRUCTANS: OCCURRENCE, STRUCTURE AND HEALTHY PROPERTIES
R. Löppert, W. Praznik, E. Cieslik
Department of Chemistry, University of Natural Resources and Applied Life Sciences, Vienna, Austria; Centre of Food Monitoring and Certification, Agricultural University, Cracow, Poland
renate.loepfert@boku.ac.at

10:20 – 11:20 Coffee Break / Exhibition

**11:20 – 12:20 Oral session 2 “ISOLATIONS, CHARACTERIZATION
AND ANALYSES OF POLYSACCHARIDES”
chairman: Ján Hirsch**

**11:20 – 12:00 Keynote lecture: MOLECULAR DIMENSION AND STRUCTURE OF WATER
SOLUBLE POLYSACCHARIDES BY MEANS OF ADEQUATE
CHROMATOGRAPHIC TECHNIQUES WITH DIFFERENT DETECTION
SYSTEMS**

W. Praznik, R. Loeppert, A. Huber

*Plant Carbohydrates group, Department of Chemistry, University of Natural
Resources and Applied Life Science, Vienna, Austria; CePoL/MC - Central Polymer
Lab / Molecular Characteristics, IfC -Institut für Chemie, KF-Univ Graz, Austria
werner.praznik@boku.ac.at*

12:00 – 12:15 CHARACTERIZATION OF CHITINOUS POLYAMINOGLYCOSIDES

**G. Tiščenko, J. Šimůnek, J. Brus, M. Netopilík, Z. Walterová, M. Pekárek, J.
Lenfeld, I. Koppová**

*Institute of Macromolecular Chemistry, Academy of Sciences of Czech Republic, v.v.i.,
Prague, Czech Republic; Institute of Animal Physiology & Genetics, Academy of
Sciences of Czech Republic, v.v.i., Prague, Czech Republic
tiscenko@imc.cas.cz*

**12:15 – 12:30 THE MULTIVARIATE ANALYSIS OF VIBRATIONAL SPECTRA OF
WOOD MUSHROOMS OF GENERA *PHELLINUS* AND *INONOTUS***

K. G. Gomba, J. Čopíková, M. Tomšovský, A. Synytsya

*Institute of Chemical Technology, Prague, Czech Republic; Mendel University of
Agriculture and Forestry in Brno, Czech Republic
gkgomba@vscht.cz*

12:30 – 12:45 ISOLATION AND CHARACTERIZATION OF ARABINOXYLANS FROM CEREALS

K. Buksa

*Department of Carbohydrate Technology, University of Agriculture, Cracow, Poland
krzysiek__b@onet.eu*

**12:45 – 13:00 AN ARABINOGALACTAN-PROTEIN ISOLATED FROM INSTANT COFFEE
POWDER OF *Coffea arabica***

M. Matulová, P. Capek, J. Kozák, L. Navarini, F. S. Liverani

*Institute of Chemistry, Center for Glycomics, Slovak Academy of Sciences, Bratislava,
Slovakia; Illycaffè S.p.A., Research & Innovation, Trieste, Italy
chemcape@savba.sk*

13:00 – 14:00 LUNCH

14:00 – 14:45

Oral session 3 “PHYSICAL PROPERTIES AND AGING OF MATERIALS BASED ON POLYSACCHARIDES”
chairman: Krzysztof Surowka

- 14:00 – 14:15 **AGING OF CELLULOSE – A SURVEY OF RECENT KNOWLEDGE**
M. Milichovsky, M. Filipi, S. Milichovska, P. Havelka, T. Sopuch
Department of Wood, Pulp and Paper, Faculty of Chemical Technology, University of Pardubice, Czech Republic.; VUOS a.s., Pardubice-Rybitví, Czech Republic; AliaChem a.s., division Synthesia, Pardubice-Semtín, Czech Republic
miloslav.milichovsky@upce.cz
- 14:15 – 14:30 **INFLUENCE OF AGEING ON PROPERTIES OF STARCH – CLAY NANOCOMPOSITES**
P. Duchek, J. Dlouhý, M. Špírková, A. Strachota, R. Čerstvý
Faculty of Mechanical Engineering, University of West Bohemia, Plzeň; Institute of Macromolecular Chemistry, Academy of Sciences of the Czech Republic, Prague,
duchekpe@kmm.zcu.cz
- 14:30 – 14:45 **COMPLEX STARCH TRANSFORMATION IN POTATO AS DETERMINED BY DMA**
M. Lahodová, J. Blahovec
Czech University of Life Sciences, Prague, Czech Republic
lahodova@tf.czu.cz

14:45 – 15:15

Coffee Break

15:15 – 16:50

Oral session 4 “IMAGE ANALYSIS APPLICATION”
chairman: Zdeněk Bubník

- 15:15 – 15:55 **Keynote lecture: SEED IDENTIFICATION BY MEANS OF IMAGE ANALYSIS AND LINEAR DISCRIMINANT ANALYSIS: CASE STUDIES**
G. Venora, O. Grillo
Stazione Sperimentale di Granicoltura per la Sicilia, Caltagirone – Italy
venora@granicoltura.it
- 15:55 – 16:05 **IMAGE ANALYSIS – commercial presentation**
V. Brand, Laboratory imaging
- 16:05 – 16:20 **IMAGE ANALYSIS AS A TOOL FOR SUGAR AND STARCH TECHNOLOGY**
E. Šárka, Z. Bubník
Department of Carbohydrate Chemistry and Technology, Institute of Chemical Technology Prague, Czech Republic
evzen.sarka@vscht.cz
- 16:20 – 16:35 **LIGHT MICROSCOPY AND IMAGE ANALYSIS AS A SUITABLE SCREENING METHOD FOR CHARACTERIZATION OF WHEAT STARCH GRANULES**
V. Dvořáček, J. Lukáš, D. Novotný, L. Papoušková
Crop Research Institute, Prague, Czech Republic
dvoracek@vurv.cz
- 16:35 – 16:50 **SEED TYPE IDENTIFICATION BY USING IMAGE ANALYSIS – CORRELATION OF NUTRITIVE COMPOUNDS WITH SIZE, SHAPE AND COLOR CHARACTERISTICS**
I. Smýkalová, M. Hýbl, M. Pavelek, J. Horáček
Department of Biotechnology, Department of Grain Legumes, and Department of Technical Crops, Agritec Plant Research, Ltd. Šumperk, Czech Republic
smykalova@agritec.cz

17:30 – 18:30

Guided tour of Clementinum complex including the Astronomical Tower, the Mirror Chapel and the Baroque Library Hall

- 1.1. M. Brlejšová, M. Čertík,
P. Rapta, V. Brezová INFLUENCE OF YEAST MORPHOLOGY ON THE PROPERTIES OF CELL WALL GLYCOPROTEINS
- 1.2. R. Buřfa, V. Velebny NEW METHOD FOR PREPARATION OF CROSSLINKED HYALURONIC ACID DERIVATIVES WITH DIETHYLENETRIAMINEPENTAACETIC ACID AND THEIR METAL COMPLEXES. SYNTHESIS, EVALUATION AND STRUCTURE ANALYSIS
- 1.3. K. Buřsa, A. Nowotna THE INFLUENCE OF DIFFERENT OXIDATIVE AGENTS ON RHEOLOGICAL PROPERTIES OF RYE FLOUR WATER EXTRACT
- 1.4. K. Buřsa, S. Kowalski,
A. Nowotna THE INFLUENCE OF CROSSLINKING OF ARABINOXYLAN – PROTEIN COMPLEX ON RHEOLOGICAL PROPERTIES OF WATER SOLUBLES OBTAINED FROM RYE FLOUR
- 1.5. E. Firatlıgil-Durmus,
O. Evranuz SORPTION PROPERTIES OF PLUM PUREE EDIBLE FILMS: EFFECT OF APPLE PUREE AND WHEY PROTEIN ISOLATE
- 1.6. M. Foglarova, V. Velebny MODIFIED HYALURONIC ACID HYDROGELS
- 1.7. P. O. Gouda, P. V. Babu,
N. Kalyani, N. L. Sudeepthi,
K. E. Kumar,
S. Satyanarayana SUB ACUTE STUDY OF HYPOGLYCAEMIC/ HYPOLIPIDEMIC EFFECTS OF NATURAL POLYSACCHARIDE *Cochlospermum gossypium* IN NORMAL FED RATS
- 1.8. M. Havrlentová, S. Šliková,
V. Šudyová, P. Hauptvogel,
A. Burgárová ANALYSIS OF MIXED-LINKED (1→3)(1→4)-β-D-GLUCAN IN WHEAT CULTIVARS (*Triticum aestivum* L.) AND POSSIBILITIES OF ITS UTILIZATION
- 1.9. M. Havrlentová, S. Šliková,
V. Šudyová, P. Hauptvogel CONTENT OF β (1→4) -β-D-GLUCAN IN WHEAT CULTIVARS AFTER ARTIFICIAL INFECTION WITH FUNGI *Fusarium culmorum* SACC.
- 1.10. A. Heřlova, J. Blahovec DEFORMATION CURVES IN TENSILE TESTS OF β-GLUCAN FILMS
- 1.11. Z. Košťálová, Z. Hromádkova,
A. Ebringerová, J. Hirsch POTENTIAL ANTIOXIDANT CAPACITY OF WATER SOLUBLE POLYSACCHARIDES OF THE OIL PUMPKIN BIOMASS
- 1.12. I. Jablonský, R. Ryzner,
M. Libich FIRST EXPERIENCE WITH CULTIVATION OF HIMEMATSUTAKE MUSHROOM (*Agaricus brasiliensis*) IN THE CZECH REPUBLIC
- 1.13. G. Jaworska, E. Bernaś,
R. Skoczzeń-Słupska CONTENT OF CARBOHYDRATE COMPOUNDS IN CANNED EDIBLE MUSHROOMS
- 1.14. J. Słupski, J. Achrem-
Achremowicz, Z. Lisiewska,
G. Jaworska THE CONTENT OF SELECTED CARBOHYDRATES IN THE FRESH AND COOKED SEVERAL VARIETIES OF IMMATURE SEEDS FLAGEOLET BEANS TYPE
- 1.15. J. Krejščová RELATIONSHIP BETWEEN CONTENT OF SOIL POLYSACCHARIDES AND SOME SOIL DIAGNOSTIC PARAMETERS
- 1.16. T. Muthny, J. Dvorakova,
L. Vistejnova, V. Velebny THE INFLUENCE OF NEW HYALURONIC ACID DERIVATIVE ON SKIN CELLS PROLIFERATION
- 1.17. M. Novák, J. Blahovec,
A. Heřlova, A. Synytsya,
O. Gedeon, Alla Synytsya,
P. Slepíčka, V. Procházka,
J. Čopíková PHYSICAL AND MECHANICAL PROPERTIES OF β(1-3),(1-6)-D-GLUCAN FOILS
- 1.18. J. Ostrowska-Czubenko,
M. Pieróg MODIFIED CHITOSAN HYDROGEL MEMBRANES FOR TECHNICAL AND PHARMACEUTICAL APPLICATIONS
- 1.19. K. Povedičová, L. Diblíková,
L. Čurda VYUŽITÍ KAPALINOVÉ CHROMATOGRAFIE PŘI STANOVENÍ OLIGOSACHARIDŮ

- 1.20. E. Potočka, W. Gustaw, E. Solařská FRUCTOOLIGOSACCHARIDES AS TEXTURE IMPROVING AGENT IN MILK DESSERTS
- 1.21. K. Surówka, M. Rzepka, A. Dandar, J. Augustin STORAGE STABILITY OF THE QUAIL (*Coturnix coturnix*) EGG PASTA
- 1.22. Z. Šramková, E. Gregová, E. Šturdík, M. Havrlentová, J. Jurovátá VARIATION IN THE CONTENT OF DIETARY FIBRE IN BREAD WHEAT VARIETIES
- 1.23. I. Švec, M. Hrušková, M. Krpálková, M. Kostelanská OBRAZOVÁ ANALÝZA JAKO OBJEKTIVNÍ METODA HODNOCENÍ STRÍDY PEČIVA
- 1.24. M. Tomczynska-Mleko INFLUENCE OF DRYING ON RHEOLOGICAL PROPERTIES OF MARSHMALLOWS
- 1.25. K. Vaculová, R. Mikulíková, M. Balounová, K. Benešová VARIABILITY OF NON-STARCH POLYSACCHARIDES IN GRAIN OF VARIOUS BARLEY GENOTYPES
- 1.26. K. Zielińska, A. Chostenko, S. Truszkowski SYNTHESIS AND SWELLING BEHAVIOR OF CHITOSAN/POLY(ACRYLIC ACID) HYDROGEL MEMBRANES

13 November, 2009

Novotného lávka 5
116 68 PRAGUE 1

Oral session

09:00 – 09:45

Oral session 5 “STARCH, PECTIN: CHEMISTRY, TECHNOLOGY AND APPLICATION”
chairman: Evžen Šárka

09:00 – 09:15

EVALUATION OF STARCH CONTENT IN CANE SUGAR

M. Wojtczak, A. Antczak

*Institute of Chemical Technology of Food, Technical University of Lodz, Poland
maciej.wojtczak@p.lodz.pl*

09:15 – 09:30

RICE STARCH AS A PORE-FORMING AGENT IN CERAMIC TECHNOLOGY

Z. Živcová, E. Gregorová, W. Pabst

*Department of Glass and Ceramics, Institute of Chemical Technology, Prague, Czech Republic; Institute of Rock Structure and Mechanics, Academy of Sciences of the Czech Republic, Prague
zivcovaz@vscht.cz*

09:30 – 09:45

EFFECT OF PECTIN ADDITION ON THERMAL DENATURATION OF WHEY PROTEINS

R. Kováčová, A. Synytsya, J. Štětina, Mihulová M.

*Department of Dairy and Fat Technology and Department of Carbohydrate Chemistry and Technology, Institute of Chemical Technology Prague, Czech Republic
renata.kovacova@vscht.cz*

9:45 – 10:45

Coffee Break / Exhibition

- 2.1. *W. Berski, A. Ptaszek, P. Ptaszek, K. Buksa* RHEOLOGICAL CHARACTERISTICS OF POTATO STARCH SUSPENSIONS IN WATER BASED SOLUTIONS OF SELECTED HYDROCOLLOIDS.
- 2.2. *W. Berski, A. Zalewska, K. Buksa* SELECTED PROPERTIES OF STARCH - STARCH SYRUP BLENDS
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