

Final program

14th International Conference on
POLYSACCHARIDES-GLYCOSCIENCE



7-9 November, 2018

Novotného lávka 5,
Prague, Czech Republic



Czech
Chemical Society



UNIVERSITY OF
CHEMISTRY AND TECHNOLOGY
PRAGUE



EuChemS
European Chemical Society

7th November, 2018

17:00 – 19:00 Conference Opening (glass of wine)

ArtCafe
Karlova (Street) 2,
PRAGUE 1

8th November, 2018

08:00 – 09:00 Registration

Novotného lávka 5
116 68 PRAGUE 1

Oral session

09:00 WELCOME
JANA ČOPÍKOVÁ, UNIVERSITY OF CHEMISTRY AND TECHNOLOGY, PRAGUE
JAN JOHN, PRESIDENT OF THE CZECH CHEMICAL SOCIETY,

09:10 – 11:00 Oral session 1 “FUNCTIONALITY, CHANGES AND APPLICATION OF POLYSACCHARIDES I”
chairwoman: Jana Čopíková

09:10 – 09:50 Keynote lecture: NOVEL POLYSACCHARIDE APPLICATIONS IN FOOD: FROM SULPHUR DIOXIDE REPLACEMENT TO ACRYLAMIDE MITIGATION
M. A. Coimbra
QOPNA, Department of Chemistry, University of Aveiro, Portugal
mac@ua.pt

9:50 – 10:30 Keynote lecture: HYPOCHOLESTEROLEMIC AND HYPOLIPIDEMIC ACTIVITY OF MODIFIED POLYSACCHARIDES
M. Marounek, Z. Volek, T. Taubner, D. Dušková
Institute of Animal Science, Praha -Uhřetěves, Czech Republic
marounek.milan@vuzv.cz

10:30 – 10:45 CHEMICAL STRUCTURE AND FUNCTIONAL PROPERTIES OF FRUCTAN ISOLATED FROM *ECHINACEA PURPUREA* ROOTS BY MICROWAVE-ASSISTED EXTRACTION
N. Petkova, P. Denev
Department of Organic Chemistry and Inorganic Chemistry, Technological Faculty, University of Food Technologies, Plovdiv, Bulgaria
petkovanadejda@abv.bg

10:45 – 11:00 **OAT BETA-GLUCAN AS A CLEAN-LABEL ALTERNATIVE TO STRUCTURE-MAKING AGENTS IN GLUTEN FREE YEAST LEAVENED CAKE PRODUCTION**
S. Karp, J. Wyrwisz, M. Moczowska, M. Kurek
Department of Technique and Food Development, Warsaw University of Life Sciences, Poland
sabina_karp@sggw.pl

11:00 – 12:00 **Coffee Break / Exhibition**

12:00 – 13:10 **Oral session 2 “FUNCTIONALITY, CHANGES AND APPLICATION OF POLYSACCHARIDES II”**
chairman: Andrej Sinica

12:00 – 12:40 **Keynote lecture: BETA-GLUCANS: WHAT APPLICATIONS? A GENERAL OVERVIEW**
L. Vannucci, R. Mishra, P. Lukač, P. Tenti, L. Rajsiglová, V. Vetvicka, P. Šima
Laboratory of Immunotherapy, Institute of Microbiology, Czech Academy of Sciences, Prague, Czech Republic; Department of Pathology, University of Louisville, USA
vannucci@biomed.cas.cz

12:40 – 12:55 **UP-SCALING BIOPLASTICS FORMULATIONS: FROM SOLVENT CASTING TO EXTRUSION AND INJECTION PROCESSES**
I. Gonçalves, J. Lopes, G. Oliveira, L. Pires, C. Nunes, J. M. Oliveira, P. Ferreira, M. A. Coimbra
QOPNA, Department of Chemistry; CICECO - Aveiro Institute of Materials, Department of Materials and Ceramic Engineering; School of Design, Management and Production Technologies, University of Aveiro, Santiago de Riba-Ul, Portugal
idalina@ua.pt

12:55 – 13:10 **THE SOME OF THE NOVEL APPROACHES IN CEREAL PROCESSING AND ITS EFFECT ON THE QUALITY OF POLYSACCHARIDES**
M. Slukova, P. Skrivan
Department of Carbohydrates and Cereals, University of Chemistry and Technology Prague, Czech Republic
Marcela.Slukova@vscht.cz

13:10 – 14:10 **LUNCH**

14:10 – 15:20 **Oral session 3 “NANOPARTICLES OF POLYSACCHARIDES”**
chairman: Krzysztof Surówka

14:10 – 14:50 **Keynote lecture: POLYSACCHARIDE NANOMATERIALS AND POTENTIAL APPLICATIONS**
A. Dufresne
Univ. Grenoble Alpes, CNRS, France
alain.dufresne@pagora.grenoble-inp.fr

14:50 – 15:05 **CELLULOSIC MATERIALS EXTRACTED FROM POSIDONIA OCEANICA RESIDUES WITH POTENTIAL IN FOOD PACKAGING APPLICATIONS**
I. Benito-González, A. López-Rubio, R. Gavara, M. Martínez-Sanz
Food Safety and Preservation Department, IATA-CSIC, Paterna, Valencia, Spain
isaacbg@iata.csic.es

15:05 – 15:20 **STARCH NANOPARTICLES PREPARATION: THE THIRD WAY**
E. Šárka, E. Menšíková, P. Ulbrich, P. Smrčková
Department of Carbohydrates and Cereals; Department of Biochemistry and Microbiology, University of Chemistry and Technology, Prague 6, Czech Republic
evzen.sarka@vscht.cz

15:20 – 15:35 **STARCH NANOCRYSTALS – NEW STABILISERS FOR DISPERSED SYSTEMS PRODUCED WITH EDIBLE OILS**
J. Kruk, P. Ptaszek, K. Kaczmarczyk
University of Agriculture in Krakow, Faculty of Food Technology, Department of Engineering and Machinery in Food Industry, Krakow, Poland
kacper.kaczmarczyk@urk.edu.pl

15:35 – 17:00 **Coffee Break / Exhibition**

17:00 – 21:00

Transportation, Conference Party and Sightseeing at the Benedictine monastery of Prague-Břevnov



Posters

- 1.1. *L. Masewicz,
J. Lewandowicz, J. Le Thanh-
Blicharz, K. Walkowiak,
H. M. Baranowska* Water activity of hydrated potato starch aerogels
- 1.2. *K. Walkowiak,
J. Lewandowicz,
L. Masewicz, J. Le Thanh-
Blicharz, H. M. Baranowska* Application of empirical model of relationship of spin-lattice relaxation times and values of critical hydration for analysis of potato starch aerogels
- 1.3. *A. Blicharz-Kania,
D. Andrejko, A. Sagan,
M. Krajewska, K. Kozłowicz,
B. Zdybel* Effect of thermal treatment of Jerusalem artichoke tubers on the inulin content
- 1.4. *K. Kozłowicz, A. Blicharz-
Kania* Characteristics of the effect of inulin and maltodextrin on selected thermophysical properties of fruit and vegetable sorbet

- 1.5. *K. Buksa* Application of modified arabinoxylans in rye bread obtained by postponed baking method
- 1.6. *K. Buksa, A. Łakomy, M. Krystyjan* Comparison of arabinoxylans and other polysaccharides extracted under standardized conditions from outer parts of grain of various cereals
- 1.7. *V. Dvořáček, Z. Dvořáková, V. Plachý, M. Kaválek* Changes of selected wheat polysaccharides after extrusion with emphasis on poultry fattening
- 1.8. *Z. Dvořáková, V. Dvořáček, J. Doležalová* Variability of selected non-starch polysaccharides in modern wheat cultivars
- 1.9. *U. Goik, T. Goik, M. Grzesik, D. Sajęcka* Rheological properties of cosmetic gel with the xanthan gum addition
- 1.10. *U. Goik, T. Goik, M. Grzesik, T. Witczak, D. Żmudziński* The influence of concentration and temperature on the rheological properties of aqueous solutions of sodium alginate
- 1.11. *A. Bridneva, T. Uhlířová, E. Gregorová* Foaming with wheat flour and starch – a new processing technique to obtain highly porous hydroxyapatite ceramics
- 1.12. *D. Galkowska, P. Cyganik* Physicochemical and rheological properties of systems containing modified potato starch and potato protein
- 1.13. *T. Witczak, D. Galkowska, M. Krężolek* Study of water desorption of spelt flour pasta
- 1.14. *A. Stępień, T. Witczak, M. Witczak, M. Grzesik* Critical storage conditions and surface properties of commercial maltodextrins with different dextrose equivalent
- 1.15. *D. Gumul, R. Ziobro, M. Krystyjan, H. Gambuś* The influence of various levels of irradiation on content of starch and non-starch polysaccharides in rye grain
- 1.16. *D. Gumul, R. Ziobro, H. Gambuś, M. Krystyjan* The content of carbohydrates, dietary fiber and pentosans in rye grain and bran
- 1.17. *I. P. Čepková Hlásná, J. Doležalová, D. Janovská, M. Jágr* Properties of composite flours with the addition of different types of germinated grains
- 1.18. *Z. Hromádková, Z. Košťálová* Ultrasound extraction, purification, and physicochemical properties of arabinogalactan fractions from European larch (*Larix deciduas*) sawdust
- 1.19. *M. Hrušková, I. Švec* Effect of fiber from different linseed crops on viscosity profiles of composite flour
- 1.20. *I. Švec, M. Hrušková* Effect of quinoa and canahua milled products on viscosity profiles of composite flour
- 1.21. *A. Zajęc, E. Jamróz* Physical and antimicrobial properties of furcellaran films containing tea tree essential oil
- 1.22. *K. Widor, E. Jamróz, P. Kulwik* The physical and antioxidant characterization of furcellaran/gelatin films with black tea extract
- 1.23. *O. Jirsa, I. Poliřenská, I. Sedláčková* Assessment of the rheological properties of rye using Mixolab
- 1.24. *L. Jurkaninova, M. Slukova, L. Kumbarova, M. Libenkova, P. Skrivan* The evaluation of resistant starch in cereal food with higher moisture
- 1.25. *T. Kalousková, K. Zítková, R. Bleha, A. Sinica, J. Čopíková* Dietary fiber in cocoa beans products and ingredients

- 1.26. *G. Khachatryan, K. Khachatryan, M. Krystijan, L. Pardus, E. Bebak, J. Grzyb* Formation and properties of chitosan/nanosilver bionanocomposite
- 1.27. *S G. Khachatryan, K. Khachatryan, M. Krystijan, L. Pardus* Preparation and properties of gels and foils from starch treated with low-temperature low-frequency glow plasma (LPGP)
- 1.28. *K. Khachatryan, G. Khachatryan, L. Krzemińska-Fiedorowicz, K. Lotycz* Starch based nanocomposites as sensors for Cu²⁺ ions
- 1.29. *K. Khachatryan, G. Khachatryan, A. Konieczna-Molenda, M. Janik* Bionanocomposite of ZnS nanoparticles in carboxymethyl cellulose as sensor of food freshness
- 1.30. *Z. Kobus, A. Blicharz-Kania, A. Pecyna* The content of reducing and total sugars in apple pomace
- 1.31. *K. Królikowska, S. Pietrzyk, P. Pająk* Influence of acid hydrolysis on effectiveness of potato starch complexation with oleic acid
- 1.32. *K. Królikowska, T. Fortuna, J. Obrzut* Rheological properties of octenylsuccinate starches differed in amylose content
- 1.33. *I. Wojtasik-Kalinowska, A. Szpicer, A. Onopiuk, M. Marcinkowska-Lesiak, A. Półtorak, A. Wierzbicka* Modelling the structure of yoghurts containing oat β-glucan
- 1.34. *M. Zajęc, P. Kulawik, J. Tkaczewska, W. Migdał, S. Maślorz* Rheological properties of meat batters containing various fibre additives
- 1.35. *D. Żmudziński, M. Żurek, M. Grzesik* The effect of freezing on the quality of gluten-free bread made from various raw materials
- 1.36. *D. Żmudziński, M. Żurek* The effect of fiber addition on the quality of gluten-free bread
- 1.37. *A. Stępień, M. Witczak, T. Witczak, M. Grzesik* Water adsorption isotherms of freeze-dried avocado powder with inulin as a carrier material
- 1.38. *A. Stępień, M. Witczak, T. Witczak, M. Grzesik* Effect of maltodextrin addition on water sorption isotherm of freeze-dried avocado powder
- 1.39. *L. Juszcak, M. Witczak, K. Pycia* Mechanical and textural properties of wheat starch gels
- 1.40. *K. Wilczyński, Z. Kobus, R. Nadulski* The effect of screw press construction on the content of selected carbohydrate in apple juice
- 1.41. *M. Golonka, P. Ptaszek, A. Ptaszek, P. Szlachcic, M. Tataruch* Utilization of a polymeric carrier for carrying out the starch hydrolysis reaction using immobilized amylolytic enzymes
- 1.42. *K. Kaczmarczyk, J. Kruk* Rheological properties of selected polysaccharides during extensional flow
- 1.43. *M. Pancierz, A. Ptaszek* Hydrodynamic properties of apple pectin

- 1.44. D. Poniewska, R. Duliński, Saccharides - bioavailability in vitro from microalgae enriched bread
 E. Byczyński, A. Karbowski,
 A. Wikiera, K. Żyła
- 1.45. A. Korus, R. Skoczeń-Słupska, Content of carbohydrate compounds in kale (*Brassica oleracea* L. var. *Acephala*)
 J. Słupski, E. Bernaś, depending on the cultivar and the harvest date
 P. Gębczyński
- 1.46. J. Słupski, M. Zajac, Modeling of fiber content in vegetarian pastes by using various vegetables
 E. Bernaś, Ł. Skoczylas,
 R. Skoczeń-Słupska

9th November, 2018

Novotného lávka 5
 116 68 PRAGUE 1

Oral session

09:00 – 11:00

**Oral session 5 “ISOLATION AND CHARACTERIZATION
 OF POLYSACCHARIDES”
 chairman: Ján Hirsch**

- 09:00 – 09:15** **COMPARISON OF DEGRADATION PRODUCTS GENERATED DURING
 OXIDATIVE REDUCTIVE DEPOLYMERIZATION AND ACID
 HYDROLYSIS OF HYALURONAN**
 D. Čožiková, M. Hermannová, R. Buffa, T. Foglová, K. Nešporová, O. Kotland,
 V. Velebný
Contipro a.s., Dolní Dobrouč, Czech Republic
Dagmar.Cozikova@contipro.com
- 09:15 – 09:30** **EFFECT OF EXTRACTION METHOD ON ANTIOXIDANT PROPERTIES
 OF CEREAL BETA GLUCAN**
 M. Moczowska, S. Karp, J. Wyrwicz, M. Kurek
*Department of Technique and Food Development, Warsaw University of Life
 Sciences, Poland*
malgorzata_moczowska@sggw.pl
- 09:30 – 09:45** **ISOLATION OF POLYSACCHARIDE AND SPOROPOLLENIN FROM
 SUNFLOWER BEE POLLEN CELL WALLS**
 R. Bleha, J. Brindza, P. Capek, A. Sinica
*Department of Carbohydrates and Cereals, UCT Prague, Czech Republic; Institute of
 Biodiversity Conservation and Biosafety, Faculty of Agrobiological and Food
 Resources, Slovak University of Agriculture, Nitra, Slovak Republic; Institute of
 Chemistry, Centre for Glycomics, SAS, Bratislava, Slovakia*
Roman.Bleha@vscht.cz
- 09:45 – 10:00** **FRACTIONATION OF FLAXSEED MUCILAGE POLYSACCHARIDES BY
 CHEMICAL AND SEPARATION METHODS**
 Ya. Troshchynska, A. Synytsya, J. Štětina, S. Silva, S. Ferreira, E. Coelho, M. A.
 Coimbra
*Department of Dairy, Fat and Cosmetics; Department of Carbohydrates and Cereals,
 University of Chemistry and Technology Prague, Czech Republic; Department of
 Chemistry, University of Aveiro, Portugal*
troshchy@vscht.cz

- 10:00 – 10:15** **CHANGES IN THE PROFILE AND COMPOSITION OF POLYSACCHARIDES ISOLATED FROM TWO NOPAL SPECIES (*OPUNTIA FICUS-INDICA* AND *OPUNTIA XOCONOSTLE*) AFTER DIFFERENT THERMAL TREATMENTS**
J. M. Cruz Rubio, M. Mueller, H. Viernstein, R. Loeppert, W. Praznik
Department of Pharmaceutical Technology and Biopharmaceutics, University of Vienna, Austria
jmcruz1982@gmail.com
- 10:15 – 10:30** **SWEET QUINOLONES**
V. Milata, J. Lokaj
Department of Organic Chemistry, Institute of Organic Chemistry, Catalysis and Petrochemistry; Faculty of Chemistry and Food Technology, Slovak University of Technology, Bratislava, Slovakia
viktor.milata@stuba.sk
- 10:30 – 10:45** **EVALUATION OF GALACTOMANNANS HYDROLYSIS USING IMAGE PROCESSING, LASER LIGHT SCATTERING AND IR SPECTROMETRY**
S. Gillarová, S. Henke, P. Smrčková, A. Sinica, M. Sluková, Z. Bubník
Department of Carbohydrates and Cereals, University of Chemistry and Technology, Prague, Czech Republic
simona.gillarova@vscht.cz
- 10:45 – 11:00** **APPLIED OF POLYSACCHARIDES TO CREATE THE STRUCTURE OF SELECTED FOOD PRODUCTS**
A. Wierzbicka, A. Póltorak, I. Wojtasik-Kalinowska, A. Onopiuk, A. Szpicier, M. Marcinkowska-Lesiak, G. Pogorzelski, A. Stelmasiak
Department of Technique and Food Development, Warsaw University of Life Sciences-SGGW, Warsaw, Poland
Wierzbicka_agnieszka@sggw.pl

11:00 – 12:00	Coffee Break / Exhibition
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12:00 – 13:40	Oral session 4 “STARCH APPLICATION” chairman: Krzysztof Surówka
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- 12:00 – 12:40** **Keynote lecture: THE USE OF STARCH AND STARCH-RELATED PRODUCTS IN CERAMIC TECHNOLOGY**
W. Pabst, A. Bridneva, T. Uhlířová, E. Gregorová
Department of Glass and Ceramics, University of Chemistry and Technology, Prague, Czech Republic
pabstw@vscht.cz
- 12:40 – 12:55** **BIOCHEMICAL MODIFICATIONS OF STARCH TO OBTAIN HYDROPHOBIC MATERIALS USEFUL IN THE PACKAGING INDUSTRY**
A. Żarski, K. Bajer, J. Kapuśniak
Institute of Chemistry, Environmental Protection and Biotechnology, Jan Dlugosz University in Czestochowa; Institute for Engineering of Polymer Materials and Dyes, Torun, Poland
arkadiusz.zarski@ajd.czest.pl

- 12:55 – 13:10 EVALUATION OF NATURAL WAXY STARCHES AS CLEAN LABEL FOOD INGREDIENTS**
J. Lewandowicz, J. Le Thanh-Blicharz
Chair of Production Engineering and Logistics, Faculty of Engineering Management, Poznań University of Technology; Department of Food Concentrates and Starch Products, prof. Waclaw Dąbrowski Institute of Agricultural and Food Biotechnology, Poznań, Poland
jacek.lewandowicz@put.poznan.pl, lethanh@ibprs.pl
- 13:10 – 13:25 SURFACE HYDROPHOBIZED RICE STARCH PARTICLES AT AIR/AQUEOUS INTERFACES - INTERACTION FORCES OF THE CHARGED GRANULES**
C. E. Mcnamee, Yu Sato, B. Wiege, I. Furikado, A. Marefati, T. Nylander, M. Kappl, M. Rayner
Faculty of Textile Science and Technology, Shinshu University, Nagano-ken 386-8567, Japan; Max Rubner-Institut, Federal Research Institute of Nutrition and Food, Schützenberg 12, 32756 Detmold, Germany; Physical Chemistry; Department of Food Technology, Engineering and Nutrition, Lund University, Sweden; Max Planck Institute for Polymer Research, Mainz, Germany
mcnamee@shinshu-u.ac.jp
- 13:25 – 13:40 STARCH – SOLVENT – PLASTICIZER INTERACTIONS BY MEANS OF RHEOLOGY AND LF NMR**
Z. Malyszek, H. M. Baranowska, G. Lewandowicz*
Department of Food Concentrates and Starch Products, prof. Waclaw Dąbrowski Institute of Agricultural and Food Biotechnology, Poznań; Department of Physics and Biophysics; Department of Biotechnology and Food Microbiology, Poznań University of Life Science, Poznań, Poland
grazyna.lewandowicz@up.poznan.pl
- 13:40 AWARDS, CLOSING CEREMONY**
EVŽEN ŠÁRKA, JANA ČOPIKOVÁ, PAVEL DRAŠAR
University of Chemistry and Technology, Czech Chemical Society, Prague, Czech Republic

Posters

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|------|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 2.1. | <i>M. Krystyjan, N. Petkova, G. Khachatryan, M. Ognyanov, P. Denev, M. Sikora, K. Buksa, D. Gumul, H. Gambuś</i> | Structure and properties of films prepared from pectins derived from various plants |
| 2.2. | <i>M. Sikora, A. Dobosz, M. Krystyjan, P. Tomasik, B. Borczak, W. Berski, M. Lukasiewicz, D. Gumul, H. Gambuś</i> | Long-term retrogradation of corn starch gels |
| 2.3. | <i>L. Krzemińska-Fiedorowicz, G. Khachatryan, A. Konieczna-Molenda</i> | Studies of cellulose hydrolysis kinetics affected immobilized cellulase |
| 2.4. | <i>L. Krzemińska-Fiedorowicz, K. Khachatryan, A. Konieczna-Molenda</i> | Evaluation of polysaccharides durability in syrup of marsh mallow |
| 2.5. | <i>P. Kulawik, W. Migdał, P. Guzik, M. Zajac, J. Tkaczewska</i> | Developing novel sushi products with meat from traditional Polish animal breeds |

- 2.6. *L. Kumbárová, R. Bleha, M. Sluková, K. Vaculová, P. Skřivan* Extraction and characterization of β - β -glucans from new Czech barley varieties
- 2.7. *J. Le Thanh-Blicharz, J. Lewandowicz, K. Walkowiak, Ł. Masewicz, H. M. Baranowska* The effect of hydration of OSA starch aerogels on the changes of values of the short T_{11} and long T_{12} components of the spin-lattice relaxation times
- 2.8. *J. Le Thanh-Blicharz, J. Lewandowicz, Ł. Masewicz, K. Walkowiak, H. M. Baranowska* The effect of substitution with octenylsuccinic groups on hydration of starch aerogels
- 2.9. *A. Makowska, H. M. Baranowska, G. Lewandowicz* The effect of propanediol on the pasting characteristics of oxidised starch and proton dynamics of dispersing phase
- 2.10. *P. Lišková, J. Jílková, D. Smirnou, M. Hermannová, D. Šmejkalová, K. Nešporová, V. Velebný* Preparation of non-standard even-numbered hyaluronan oligosaccharides using enzymatic catalysis
- 2.11. *A. Zawiślak, I. Maciejaszek, M. Michalczyk, M. Witek, K. Surówka* Effect of thermal treatment on the formation of antioxidant properties in gluten-free flours
- 2.12. *M. Marcinkowska-Lesiak, I. Wojtasik-Kalinowska, A. Onopiuk, A. Szpicer, A. Półtorak, A. Wierzbicka* Application of hydrogen peroxide oxidation in production of starch-based films
- 2.13. *T. Mirzayeva, R. Bleha, J. Čopíková, A. Sinica* Identification of hyaluronic acid in three dietary supplements
- 2.14. *A. Onopiuk, A. Półtorak, A. Szpicer, M. Marcinkowska-Lesiak, M. Wojtasik-Kalinowska, A. Wierzbicka* The influence of polysaccharides edible coatings on the physical and chemical properties of strawberry fruits
- 2.15. *P. Pajqk, K. Królikowska, J. Sobolewska-Zielińska, T. Fortuna, I. Przetaczek-Roźnowska* The influence of thickness and glycerol concentration on texture and optical properties of potato starch-based films
- 2.16. *P. Pajqk, T. Fortuna, L. Juszcak, R. Socha* Characteristics of sour cherries gels prepared with chemically modified waxy maize starches
- 2.17. *N. Petkova, S. Krustev, P. Denev* Enrichment of nutritional properties of wheat breads by addition of antioxidants and prebiotics
- 2.18. *T. Plojharová, R. Bleha, S. Leonid, A. Sinica, J. Čopíková* Identification of algae polysaccharides in food supplement
- 2.19. *A. Półtorak, M. Marcinkowska-Lesiak, A. Szpicer, A. Onopiuk, I. Wojtasik-Kalinowska, A. Wierzbicka* Volatile compounds profile of white bread with an addition of chosen glycoside hydrolases as improvers

- 2.20. *I. Przetaczek-Rożnowska, J. Rożnowski, T. Fortuna, S. Jarząbek, P. Pająk* Selected properties of phosphorylated quinoa starch modified under various conditions
- 2.21. *I. Przetaczek-Rożnowska, J. Rożnowski, T. Fortuna, Ż. Piątek, P. Pająk* Characteristic of some properties of quinoa distarch phosphate
- 2.22. *M. Liszka-Skoczylas, Ł. Skoczylas, M. Grzesik* Collative properties of water and non-water wheat starch solutions
- 2.23. *M. Liszka-Skoczylas, Ł. Skoczylas, W. Berski, S. Sylwester, I. Kowalska, J. Ślupski, M. Tabaszewska* The influence of plant fertilization with iodine and selen on physicochemical properties of isolated starch
- 2.24. *P. Skrivan, M. Slukova, L. Jurkaninova, A. Mandova, K. Horakova* Physical and physico-chemical properties of a new type of wholemeal flours
- 2.25. *P. Smrčková, E. Šárka, L. Hloušková* Evaluation of physicochemical properties and selected nutritional parameters in laboratory prepared extrudates
- 2.26. *J. Sobolewska-Zielińska, S. Pietrzyk, T. Fortuna, M. Łabanowska, M. Kurdziel* Effect of chemical and physical modification on functional properties of selected cereal starches
- 2.27. *S. Pietrzyk, J. Sobolewska-Zielińska, T. Fortuna, M. Kaczmarczyk* The influence of degree of acid hydrolysis of corn starch on its oxidation and physicochemical properties
- 2.28. *K. Surówka, D. Krokosz, J. Rychlicka-Rybska, M. Witek, P. Nieckarz, I. Maciejaszek, G. Fiutak* Molecular mobility changes during hydration of carrageenan studied by NMR relaxation
- 2.29. *M. Witek, I. Maciejaszek, J. Majcherczyk, J. Banaś, K. Surówka* Probing water mobility during staling of traditional wheat bread product
- 2.30. *L. Sushytskyi, R. Bleha, A. Sinica, P. Capek, J. Čopíková, P. Kaštánek* Water-soluble polysaccharides isolated from biomass of chlorophyll-deficient microalgae *Chlorella*
- 2.31. *A. Szpicer, A. Onopiuk, I. Wojtasik-Kalinowska, M. Marcinkowska-Lesiak, A. Półtorak, A. Wierzbicka* Use of polysaccharides in production low-fat meat products
- 2.32. *E. Šárka, L. Moravcová, P. Smrčková* Bread with added starch diphosphate in the dough
- 2.33. *T. Taubner, J. Vlčková, M. Marounek* Distribution of activity of hydrolytic enzymes and the effect on polysaccharides, lipids and proteins in the digestive tract of coypus
- 2.34. *L. Třešňáková, R. Bleha, J. Čopíková, A. Sinica* Spectroscopic characterisation of chaga (*Inonotus obliquus*) preparations: a contribution of phenolics and polysaccharides
- 2.35. *K. Vaculová, O. Jirsa, I. Sedláčková, M. Sluková* Effect of controlled germination on nutrient content and nutritional properties of wholemeal flour and grain milling fractions from different barley varieties

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