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CONTENT / SADRŽAJ

Theme lecture / Tematsko predavanje

Vlasta Piližota

AKADEMIK DRAGUTIN FLEŠ, ZNANSTVENOISTRAŽIVAČKI RAD I NJEGOVA POVEZANOST S LEOPOLDOM (LAVOSLAVOM) RUŽIČKOM ACADEMICIAN DRAGUTIN FLEŠ, HIS SCIENTIFIC-RESEARCH WORK AND HIS CONNECTION WITH LEOPOLD (LAVOSLAV) RUŽIČKA.....	1
--	---

Plenary lectures / Plenarna predavanja

Igor Stagljär

NEW PRECISION MEDICINES IN EGFR-MUTATED NON-SMALL CELL LUNG CANCER.....	3
---	---

David M. Smith

COMPUTATIONAL SIMULATIONS OF COMPLEX CATALYSIS: FROM ENZYMES TO CHEMICAL REACTORS.....	4
--	---

Nenad Bolf

DIGITALNA TRANSFORMACIJA KEMIJSKE INDUSTRIJE DIGITAL TRANSFORMATION OF THE CHEMICAL INDUSTRY.....	5
--	---

Sandra Kraljević Pavelić

ANORGANSKI IONSKI IZMJENJIVAČI I NJIHOVI BIOLOŠKI UČINCI IN VIVO INORGANIC ZEOLITE CATION EXCHANGERS AND THEIR BIOLOGICAL EFFECTS IN VIVO...	6
---	---

Mojca Škerget, Željko Knez

SUPERKRTIČNI FLUIDI KAO ZELENİ MEDIJ ZA SEPARACIJSKE PROCESSE I FORMULACIJU PROIZVODA SUPERCRITICAL FLUIDS AS GREEN MEDIA FOR SEPARATION PROCESSES AND PRODUCT FORMULATION	7
---	---

Invited lectures / Pozvana predavanja

Vladimir V. Srdic, Branimir Bajac, Jelena Vukmirovic, Andrea Nesterovic, Biljana Stojanovic

FEROIČNI I MULTIFEROIČNI TANKI FILMOVI FERROIC AND MULTIFERRIOIC THIN FILMS.....	9
---	---

Aleksandar Sečenji, Barbara Horváth, Barna Kovács

RAZVOJ OPTIČKOG NANOSENZORA ZA INTRACELULARNO MJERENJE pH I NJEGOVO SLIKOVNO PRIKAZIVANJE DEVELOPMENT OF OPTICAL NANOSENSOR FOR INTRACELLULAR pH MEASUREMENT AND IMAGING.....	10
--	----

Zora Pilić

PRIRODNI PRODUKTI KAO POTENCIJALNI INHIBITORI KOROZIJE NATURAL PRODUCTS AS POTENTIAL CORROSION INHIBITORS.....	11
---	----

Matko Erceg

KINETIČKA ANALIZA TOPLINSKE RAZGRADNJE POLIMERA KINETIC ANALYSIS OF THE THERMAL DEGRADATION OF POLYMERS.....	12
---	----

Maja Molnar

PRIMJENA EUTEKTIČKIH OTAPALA NA BAZI KOLIN-KLORIDA U SINTEZI HETEROCIKLIČKIH SPOJEVA APPLICATION OF CHOLINE CHLORIDE BASED DEEP EUTECTIC SOLVENTS IN SYNTHESIS OF HETEROCYCLIC COMPOUNDS.....	13
---	----

Chemical analysis and synthesis / Kemijska analiza i sinteza

Olivera Galović, Manuela Grčević

USPOREDBA METODA ZA PRIPREMU UZORAKA RAZLIČITIH VRSTA ULJA ZA ANALIZU PROFILA MASNIH KISELINA POMOĆU GC COMPARISON OF METHODS FOR SAMPLE PREPARATION OF DIFFERENT TYPES OF OILS FOR FATTY ACID PROFILE ANALYSIS BY GC.....	15
---	----

Marija Jozanović, Nikola Sakač, Milan Sak-Bosnar†, Emanuel Carrilho

ODREĐIVANJE TERAPEUTSKIH IMIDAZOLNIH DIPEPTIDA U MESU RAZLIČITIH ŽIVOTINJSKIH VRSTA ELEKTROFOREZOM NA MIKROČIPU DETERMINATION OF THERAPEUTIC IMIDAZOLE DIPEPTIDES IN MEAT FROM DIFFERENT ANIMAL SPECIES BY MICROCHIP ELECTROPHORESIS.....	16
--	----

Robert Bedoić, Boris Ćosić, Vesna Očelić Bulatović, Ana Špehar THERMOGRAVIMETRIJSKA ANALIZA TRAVNATE BIOMASE THERMOGRAVIMETRIC ANALYSIS OF GRASS BIOMASS.....	17
Zvonimir Marijanović, Tea Žanko, Marko Šuste, Tomislav Svalina, Mladenka Šarolić ANALIZA HLAPLJIVIH SPOJEVA IZ TRAJNE KOBASICE KULENOVA SEKA STUDY OF VOLATILE COMPOUNDS FROM DRY FERMENTED SAUSAGE KULENOVA SEKA..	18
Ani Radonić, Zvonimir Marijanović PROFIL HLAPLJIVIH SPOJEVA AROME VINA SORTE KUJUNDŽUŠA VOLATILE AROMA COMPOUNDS PROFILE OF THE KUJUNDŽUŠA WINE.....	19
Marinela Ižaković, Merima Bukva, Mateja Budetić, Mirela Samardžić, Aleksandar Sečenji OPTIMIZACIJA METODE ZA ODREĐIVANJE SELENIJA U REALNIM UZORCIMA OPTIMIZATION OF THE METHOD FOR SELENIUM DETERMINATION IN REAL SAMPLES.....	20
Silvija Šafranko, Pavo Živković, Anamarija Stanković, Aleksandar Sečenji DIGITALNA TEHNOLOGIJA U KVANTITATIVNOJ KOLORIMETRIJSKOJ ANALIZI DIGITAL TECHNOLOGY IN QUANTITATIVE COLORIMETRIC ANALYSIS.....	21
Jelena Brdarić, Nikolina Filipović, Berislav Marković, Natalija Šantić, Dalibor Tatar ADSORPCIJA HIDROFILNO MODIFICIRANIH SILIKONA NA OKSIDNIM NANOČESTICAMA ADSORPTION OF HYDROPHILICALLY MODIFIED SILICONES ON OXIDE NANOPARTICLES...	22
Zrinka Buhin Šturlić, Sanja Lučić Blagojević, Mirela Leskovac, Mateja Grbac, Josip Miklečić UTJECAJ DODATKA TiO ₂ PUNILA I UV ZRAČENJA NA SVOJSTVA POLIAKRILATA INFLUENCE OF THE TiO ₂ FILLER ADDITION AND UV RADIATION ON THE PROPERTIES OF POLYACRYLATE.....	23
Irena Ivanišević, Vanja Rukavina, Stjepan Milardović UTJECAJ SLABIH ORGANSKIH KISELINA NA STABILIZACIJU NANOČESTICA SREBRA PRILIKOM NJIHOVOG TALOŽENJA INFLUENCE OF WEAK ORGANIC ACIDS DURING PRECIPITATION ON STABILIZATION OF SILVER NANOPARTICLES.....	24
A. Gojmerac Ivšić, T. Benković, D. Kontrec, N. Galić PRIMJENA METOKSI DERIVATA AROMATSKIH HIDRAZONA ZA EKSTRAKCIJU ŽELJEZA(III) APPLICATION OF METOXY DERIVATES OF AROMATIC HYDRAZONES FOR EXTRACTION OF IRON(III)	25
Martina Jakovljević, Maja Molnar, Igor Jerković, Stela Jokić OPTIMIZACIJA EKSTRAKCIJE KARNOSOLNE KISELINE I KARNOSOLA IZ KADULJE (<i>Salvia officinalis</i> L.) PRIMJENOM EUTEKTIČKIH OTAPALA OPTIMIZATION OF EXTRACTION OF CARNOSIC ACID AND CARNOSOL FROM SAGE (<i>Salvia officinalis</i> L.) IN DEEP EUTECTIC SOLVENTS.....	26
Nataša Perin, Marijana Hranjec, Petra Roškarić, Irena Sović, Ida Boček, Robert Vianello, Kristina Starčević AMINO SUPSTITUIRANI DERIVATI BENZAMIDA KAO POTENCIJALNI ANTIOKSIDANSI AMINO SUBSTITUTED BENZAMIDE DERIVATIVES AS POTENTIAL ANTIOXIDANTS.....	27
Josip Radić, Eva Bek, Iva Grbelja, Marija Bralić, Ante Prkić, Ivana Mitar PRIPRAVA NOVIH MEMBRANA ZA FLUORID IONSKO-SELEKTIVNU ELEKTRODU PREPARATION OF A NEW MEMBRANES FOR FLUORIDE ION-SELECTIVE ELECTRODE.....	28
Maja Cindrić, Nataša Perin, Marija Ćurić, Petra Marketin, Marijana Hranjec SINTEZA I SPEKTROSKOPSKA KARAKTERIZACIJA NOVIH DERIVATA BENZIMIDAZOLA SYNTHESIS AND SPECTROSCOPIC STUDY OF NOVEL BENZIMIDAZOLE DERIVATIVES.....	29
Senka Djaković, Alma Filipović, Mateja Toma, Jasmina Lapić, Davor Šakić, Valerije Vrček PRIPRAVA KONJUGATA FEROCENOIL-NUKLEOBAZA U JEDNOM SINTETSKOM KORAKU PREPARATION OF FERROCENOYL-NUCLEOBASE CONJUGATES BY ONE-STEP SYNTHETIC ROUTE.....	30
Mateja Toma, Jasmina Lapić, Romano Šunjić, Davor Šakić, Valerije Vrček, Senka Djaković REAKCIJA KOPULACIJE FEROCENA I TIO-NUKLEOBAZA THE COPULATION REACTION OF FERROCENE AND THIO-NUCLEOBASES.....	31
Jasmina Lapić, Romano Šunjić, Ana Marić, Mateja Toma, Davor Šakić, Valerije Vrček, Senka Djaković BIOKONJUGATI FEROCENA I DERIVATA URACILA: SINTEZA I SPEKTRALNA KARAKTERIZACIJA BIOCONJUGATES OF FERROCENE AND URACIL DERIVATIVES: SYNTHESIS AND SPECTRAL CHARACTERIZATION.....	32

Azra Đulović, Antonija Bodač, Ita Hajdin, Ivica Blažević MIKROVALNA SINTEZA IZOTIOCIJANATA IZ AMINA MICROWAVE SYNTHESIS OF ISOTHIOCYANATES FROM AMINES.....	33
Dajana Gašo-Sokač, Antonija Đurin, Martina Šrajter Gajdošik, Valentina Bušić MIKROVALNA SINTEZA KVATERNIH SOLI NIKOTINAMIDA SA SUPSTITUIRANIM FENACIL-BROMIDIMA MICROWAVE SYNTHESIS OF NICOTINAMIDE QUATERNARY SALTS WITH SUBSTITUTED PHENACYL BROMIDES.....	34
Mario Komar, Maja Molnar, Leon Grbeš EUTEKTIČKA OTAPALA NA BAZI KOLIN-KLORIDA U ZELENOJ SINTEZI DERIVATA KINAZOLINONA CHOLINE CHLORIDE BASED DEEP EUTECTIC SOLVENTS IN GREEN SYNTHESIS OF QUINAZOLINONE DERIVATIVES.....	35
Melita Lončarić, Maja Molnar SINTEZA DERIVATA KUMARINA KNOEVENAGELOVOM KONDEZNACIJOM U EUTEKTIČKIM OTAPALIMA SYNTHESIS OF COUMARIN DERIVATIVES VIA KNOEVENAGEL CONDENSATION IN DEEP EUTECTIC SOLVENTS.....	36
Kristina Bobanović, Marijeta Kralj, Lidija Uzelac, Ivana Murković Steinberg, Svjetlana Krištafor SINTEZA, SPEKTROSKOPSKA KARAKTERIZACIJA I CITOSTATSKA ISPITIVANJA NOVIH 1,2,3-TRIAZOLIL-KUMARINA I BIS-(KUMARIN-TRIAZOLIL)BENZENA SYNTHESIS, SPECTROSCOPIC CHARACTERIZATION AND CYTOSTATIC EVALUATION OF NOVEL 1,2,3-TRIAZOLYL-COUMARINS AND BIS-(COUMARIN-TRIAZOLYL)BENZENES.....	37
Kristijan Konopka, Mario Lovrić, Tomislav Balić, Elvira Kovač-Andrić, Martina Medvidović-Kosanović SINTEZA I KARAKTERIZACIJA KOMPLEKSNIH SPOJEVA S DERIVATOM HIDRAZIDA DIPIKOLINSKE KISELINE SYNTHESIS AND CHARACTERIZATION OF DIPICOLINIC ACID HYDRAZIDE DERIVATE AND THEIR COMPLEXES.....	38
D. Sačar, F. Raffin, S. Sopčić, D. Antonić, M. Kraljić Roković SINTEZA, KARAKTERIZACIJA I PRIMJENA GRAFENSKIH HIDROGELOVA SYNTHESIS, CHARACTERISATION AND APPLICATION OF GRAPHENE HYDROGELS.....	39
Katarina Mužina, Filip Brleković, Marija Tkalčević, Vilko Mandić, Stanislav Kurajica SOL-GEL SYNTHESIS AND PROPERTIES OF LITHIUM AND CERIUM CODOPED PEROVSKITE SOL-GEL SINTEZA I SVOJSTVA LITIJEM I CERIJEM KODOPIRANOG PEROVSKITA.....	40
Ivana Živković, Marija Paurević, Martina Šrajter Gajdošik, Rosana Ribić, Srdanka Tomić RAZVOJ SINTETSKE METODE ZA PRIPRAVU α -O-MANOZIDA OCTENE KISELINE DEVELOPMENT OF SYNTHETIC METHOD FOR THE PREPARATION OF ACETIC ACID α -O- MANNOSIDE.....	41
Glorija Fajdetić, Nikolina Suić, Lucija Ptiček, Livio Racané SINTEZA SUPSTITUIRANIH BENZOTIAZOLA U GLICEROLU KAO ZELENOM OTAPALU SYNTHESIS OF SUBSTITUTED BENZOTHAZOLES IN GLYCEROL AS A GREEN SOLVENT.....	42
V. Sokol, P. Bošković, A. Prkić, J. Giljanović IONSKA ASOCIJACIJA I NASTAJANJE TROSTRUKIH IONA U OTOPINAMA CEZIJEVOG BROMIDA U 90 %-TNOM BUTAN-2-OLU IONIC ASSOCIATION AND FORMATION OF TRIPLE IONS OF CESIUM BROMIDE IN 90% BUTAN-2-OL.....	43
Renato Tomaš, Anamaria Pensa VOLUMETRIJSKA SVOJSTVA 1-ETIL-3-METIL IMIDAZOLIJEVOG KLORIDA U METANOLU VOLUMETRIC PROPERTIES OF 1-ETHYL-3-METHYL IMIDAZOLIUM CHLORIDE IONIC LIQUIDS IN METHANOL.....	44
Dragana Vuk, Irena Škorić PRIPRAVA NOVIH ORGANSKIH SUPSTRATA REAKCIJOM FOTOKATALITIČKE OKSIGENACIJE PREPARATION OF NEW ORGANIC SUBSTRATES via PHOTOCATALYTIC OXYGENATION.....	45
Pavo Živković, Aleksandar Sečenji SINTEZA NANOČESTICA MAGNETITA U MIKROFLUIDIČKOM SUSTAVU S 2-D HIDRODINAMIČKIM FOKUSIRANJEM MAGNETITE NANOPARTICLES SYNTHESIS IN MICROFLUIDIC SYSTEM WITH 2-D HYDRODYNAMIC FOCUSING.....	46

Anamarija Stanković, Silvija Šafranko, Jasminka Kontrec, Branka Njegić Džakula, Daniel M. Lyons, Berislav Marković, Damir Kralj TALOŽENJE KALCIJEVA OKSALATA U MODELNIM SUSTAVIMA HIPEROKSALURIJE CALCIUM OXALATE PRECIPITATION IN MODEL SYSTEMS MIMICKING HYPEROXALURIA CONDITIONS.....	47
Ivana Škugor Rončević, Nives Vladislavić, Marijo Buzuk, Slobodan Brinić ELEKTRODA OD STAKLASTOG UGLJIKA MODIFICIRANA HIDROKSIAPATITOM ZA ODREĐIVANJE CISTEINA HYDROXYAPATITE FILM MODIFIED GLASSY CARBON ELECTRODE FOR DETECTION OF CYSTEINE.....	48
Anamarija Mitar, Tea Barbaro, Jasna Prlić Kardum STABILNOST NANOSUSPENZIJA PRIPREMLJENIH IZ NISKOTEMPERATURNIH EUTEKTIČKIH OTAPALA STABILITY OF NANOSUSPENSIONS PREPARED WITH DEEP EUTECTIC SOLVENTS.....	49
Nataša Stipanelov Vrandečić, Branka Andričić, Ignazio Blanco PRIPREMA NANOKOMPOZITA POLI(ETILEN OKSIDA) I POLIEDARSKIH OLIGOMERNIH SILSESKVIOKSANA PREPARATION OF POLY(ETHYLENE OXIDE) NANOCOMPOSITES WITH POLYHEDRAL OLIGOMERIC SILSESQUOXANES.....	50
<i>Chemical and biochemical engineering / Kemijsko i biokemijsko inženjerstvo</i>	
Marija Banožić, Martina Jakovljević, Ana-Marija Cikoš, Krunoslav Aladić, Mate Bilić, Stela Jokić EKSTRAKCIJA FENOLNIH SPOJEVA IZ DUHANSKOG OTPADA POTPOMOGNUTA ULTRAZVUKOM ULTRASOUND-ASSISTED EXTRACTION OF PHENOLIC COMPONENTS FROM TOBACCO WASTE	51
Tanja Gagić, Stela Jokić, Željko Knez, Mojca Škerget VISOKOTLAČNE TEHNOLOGIJE KAO EFEKTIVNE ZELENE METODE ZA EKSTRAKCIJU KAKAOVE LJUSKE HIGH-PRESSURE TECHNOLOGIES AS PROMISING GREEN METHODS FOR EXTRACTION OF COCOA SHELL.....	52
Anita Bašić, Sandra Svilović, Renato Stipišić, Nenad Kuzmanić OPTIMIZACIJA HIDRODINAMIČKIH UVJETA ZA IZMJENU BAKRA NA NaX TAGUCHIJEVOM METODOM TAGUCHI OPTIMIZATION OF HIDRODINAMIC CONDITIONS FOR COPPER EXCHANGE ON NaX.....	53
Valentina Bušić, Ivona Bunjik, Matea Martinović, Antonija Kezerle, Natalija Velić, Hrvoje Pavlović, Dajana Gašo-Sokač DESORPCIJA SINTETSKOG BOJILA KONGO CRVENILA S OBOJENOG BIOSORBENSA POMOĆU ORGANSKIH OTAPALA DESORPTION OF SYNTHETIC DYE CONGO RED FROM DYE-LOADED BIOSORBENT USING ORGANIC SOLVENTS.....	54
Marija Ćosić, Bruno Čizmić, Antonija Čelan, Nenad Kuzmanić PRIMJENA TURBIDIMETRIJSKE METODE PRI ODREĐIVANJU ŠIRINE METASTABILNE ZONE BORAKSA U ŠARŽNOM KRISTALIZATORU APLICATION OF TURBIDIMETRIC METHOD FOR DETERMINATION OF METASTABLE ZONE WIDTH OF BORAX IN A BACH CRYSTALLIZER.....	55
Hrvoje Dorić, Ivan Mohler, Nenad Bolf, Željka Ujević Andrijić METODE KONTINUIRANOG PRAĆENJA KRISTALIZACIJE REAL TIME CRYSTALLIZATION MONITORING METHODS.....	56
Stjepan Džalto, Fabio Faraguna, Ante Jukić KINETIKA TERPOLIMERIZACIJE I SVOJSTVA TERPOLIMERA ALKIL-METAKRILATA, STIRENA I <i>tert</i> -BUTILAMINOETIL-METAKRILATA TERPOLIMERIZATION KINETICS AND TERPOLYMER PROPERTIES OF ALKYL-METHACRYLATE, STYRENE AND <i>tert</i> -BUTYLAMINOETHYL-METHACRYLATE.....	57
Tena Gvozdanović, Stojan Božović, Sanja Martinez INHIBICIJA KOROZIJE KONSTRUKCIJSKOG ČELIKA U NEUTRALNOM KLORIDNOM MEDIJU SMJESOM NETOKSIČNIH KOROZIJSKIH INHIBITORA INHIBITION OF CORROSION OF THE CONSTRUCTION STEEL IN THE NEUTRAL CHLORIDE MEDIA BY MIXTURE NON TOXICAL CORROSION INHIBITORS.....	58

Irena Krešić, Matko Erceg, Zoran Grubač, Dražan Jozić, Sigrid Bernstorff, Ivana Lešina PRIPREMA I KARAKTERIZACIJA POLI(ETILEN-OKSID)/CLOISITE 93A NANOKOMPOZITNIH POLIMERNIH ELEKTROLITA PREPARATION AND CHARACTERIZATION OF POLY(ETHYLENE OXIDE)/CLOISITE 93 A NANOCOMPOSITE POLYMER ELECTROLYTES.....	59
Anita Ptiček Siročić, Stanislav Kurajica, Dragana Dogančić, Nikolina Fišter FTIR I XRD ANALIZA TLA NA PODRUČJU PLITVIČKIH JEZERA FTIR AND XRD ANALYSIS OF SOIL ON PLITVICE LAKES AREA.....	60
Roko Blažić, Ivana Vilić, Ivanka Radić, Renata Jurišić, Elvira Vidović ISPITIVANJE MJEŠAVINA MINERALNOG I ESTERSKOG ULJA ELEKTRIČNIM I TOPLINSKIM METODAMA STUDY OF MINERAL AND ESTER OILS MIXTURES BY ELECTRIC AND THERMAL METHODS	61
Vedrana Lovinčić Milovanović, Ivana Hajdinjak, Ivona Loviriša, Igor Dejanović, Domagoj Vrsaljko THE INFLUENCE OF THE DISPERSED PHASE MORPHOLOGY ON THE MECHANICAL AND THERMAL PROPERTIES OF POLYLACTIDE POLYMER BLENDS.....	62
Marija Vuković Domanovac, Martina Miloloža, Josip Leko, Monika Šabić, Martina Sudar, Zvezdana Findrik Blažević UTJECAJ ERITROMICINA NA <i>Pseudomonas putida</i> IMPACT OF ERYTHROMYCIN ON <i>Pseudomonas putida</i>	63
Ana Peršić, Paula Santini, Stjepko Krehula, Vanja Gilja, Zlata Hrnjak Murgić, Ljerka Kratofil Krehula PRIPREMA I KARAKTERIZACIJA KOMPOZITA POLIETILENA S METALNIM OKSIDIMA PREPARATION AND CHARACTERIZATION OF POLYETHYLENE/METAL OXIDE COMPOSITES.....	64
Food technology and biotechnology / Prehrambena tehnologija i biotehnologija	
Nela Nedić Tiban, Lorena Novak, Mirela Kopjar TERMOFIZIČKA SVOJSTVA MODELNIH SUSTAVA HIDROKOLOIDA I ŠEĆERA THERMOPHYSICAL PROPERTIES OF MODEL SYSTEMS OF HYDROCOLLOIDS AND SUGARS	65
Gordana Šimić, Ivan Abičić, Daniela Horvat, Georg Drezner, Alojzije Lalić SVOJSTVA BOJE BRAŠNA DOBIVENIH OD RAZLIČITIH SORTI JEČMA COLOUR CHARACTERISTICS OF DIFFERENT BARLEY FLOUR SAMPLES	66
Martina Andrejaš, Dijana Miličević, Gordan Avdić UTJECAJ KOLIČINE I VRSTE DODATKA NA SVOJSTVA KEKSA OD RIŽINOG BRAŠNA IMPACT OF THE QUANTITY AND TYPES OF ADDED MATERIALS ON BISCUITS RICE FLOUR PROPERTIES.....	67
Sandra Maričić Tarandek, Zvonimir Ladešić OKSIDATIVNA STABILNOST BILJNIH ULJA TIJEKOM ZAGRIJAVANJA NA VISOKIM TEMPERATURAMA I PRI PRŽENJU KRUMPIRA OXIDATIVE STABILITY OF EDIBLE VEGETABLE OILS DURING HEATING AT HIGH TEMPERATURES AND FRYING OF POTATOES.....	68
Sandra Zavadlav, Marijana Blažić, Elizabeta Kralj, Martin Božurić KONTROLA KVALITETE RAZLIČITIH VRSTA SIROVE I PRŽENE KAVE QUALITY CONTROL OF DIFFERENT SORTS OF RAW AND ROASTED COFFEE BEANS.....	69
Ivana Tomac, Marijana Jurić, Mario Lacković, Lidija Jakobek VOLTAMETRIJSKO ODREĐIVANJE SADRŽAJA KLOROGENSKIH KISELINA U KAVAMA VOLTAMMETRIC DETERMINATION OF CHLOROGENIC ACIDS CONTENT IN COFFEE.....	70
Nebojša Kojić, Lidija Jakobek KEMIJSKA I SENZORSKA SVOJSTVA CRNIH VINA BARANJSKOG VINOGORJA CHEMICAL AND SENSORY PROPERTIES OF RED WINES FROM BARANJA VINEYARDS.....	71
Anita Pichler, Ivana Ivić, Josipa Andabak, Maša Šafranjević, Mirela Kopjar UTJECAJ VRSTE FERMENTACIJSKE POSUDE I VREMENA SKLADIŠTENJA NA AROMATSKI PROFIL I BOJU VINA SORTE PLAVAC MALI THE INFLUENCE OF FERMENTATION VESSELS AND STORAGE TIME ON THE AROMATIC PROFILE AND COLOR OF THE PLAVAC MALI WINE VARIETY.....	72

Ante Lončarić, Antun Jozinović, Jurislav Babić, Drago Šubarić EKSTRAKCIJA UKUPNIH POLIFENOLA IZ KOMINE GROŽĐA PRIMJENOM NOVIH TEHNIKA EKSTRAKCIJE EXTRACTION OF TOTAL PHENOLS FROM GRAPE POMACE USING NOVEL EXTRACTION TECHNIQUES.....	73
Gordana Šelo, Ana Bucić-Kojić, Srećko Tomas, Marina Tišma, Mirela Planinić UTJECAJ BIOLOŠKE OBRADJE TROPA GROŽĐA POMOĆU <i>Pleurotus eryngii</i> NA POVEĆANJE UDJELA FENOLNIH KISELINA U EKSTRAKTU TROPA GROŽĐA ENHANCEMENT OF PHENOLIC ACIDS CONTENT OF GRAPE POMACE EXTRACT BASED ON SOLID-STATE FERMENTATION WITH <i>Pleurotus eryngii</i>	74
Nika Pavlović, Martina Jakovljević, Maja Molnar, Stela Jokić ULTRAZVUČNA EKSTRAKCIJA BIOAKTIVNIH KOMPONENTI IZ KAKAOVE LJUSKE ULTRASOUND-ASSISTED EXTRACTION OF BIOACTIVE COMPONENTS FROM COCOA SHELL.....	75
Antonela Ninčević Grassino, Mladen Brnčić, Vizenzia Miletić, Zoran Zorić, Verica Dragović Uzelac, Senka Djaković CHARACTERISATION OF POLYPHENOLS AND FATTY ACIDS ISOLATED FROM TOMATO PEEL WASTE KARAKTERIZACIJA POLIFENOLA I MASNIH KISELINA IZOLIRANIH IZ OTPADA KORE RAJČICE.....	76
Kristina Radošević, Martina Bagović, Igor Slivac, Marijan Logaršić, Višnja Gaurina Srček BIOLOŠKA AKTIVNOST PROTEINSKIH HIDROLIZATA IZ POGAČE KONOPLJE BIOLOGICAL ACTIVITY OF HEMP SEED CAKE PROTEIN HYDROLYSATES.....	77
Senka Vidovic, López-Rubio Amparo, Stela Jokic, Alehosseini Ali, Jelena Vladic INKAPSULACIJA SUPERKRITIČNOG EKSTRAKTA KORE MANDARINE PRIMJENOM METODE ELECTROSPRAYING INCAPSULATION OF MANDARIN PEEL SUPERCRITICAL EXTRACT BY ELECTROSPRAYING	78
Klara Tomićić, Marko Zajec, Ivica Strelec RAZDVAJANJE MOLEKULA BOJE MEDA GEL FILTRACIJOM NA SEPHADEXU G-25 SEPARATION OF HONEY COLOUR-CONTRIBUTING MOLECULES BY GEL FILTRATION ON SEPHADEX G-25.....	79
Vesna Mihaljević-Herman, Valentina Besten, Dijana Eršeg, Lidija Zemljak DETEKCIJA <i>Salmonella</i> spp. U ZAČINIMA DETECTION OF <i>Salmonella</i> spp. IN SPICES.....	80
Martina Andlar, Tonči Rezić RAZGRADNJA LIGNOCELULOZNIH SIROVINA PRIMJENOM FUNGALNIH ENZIMA DEGRADATION OF LIGNOCELLULOSE-CONTAINING RAW MATERIALS BY FUNGAL ENZYMES	81
Ivanka Grgić, Marijana Grec, Jelena Panak Balentić, Veronika Barišić, Jurislav Babić, Antun Jozinović, Drago Šubarić, Đurđica Ačkar UTJECAJ HLADNE PLAZME NA MODIFICIRANJE ŠKROBA TAPIOKE INFLUENCE OF COLD PLASMA TREATMENT ON MODIFICATION OF TAPIOCA STARCH.....	82
Višnja Stulić, Tomislava Vukušić, Anet Režek Jambrak, Zoran Herceg PRIMJENA HLADNE PLAZME NA INAKTIVACIJU STANICA KVASCA <i>Saccharomyces cerevisiae</i> APPLICATION OF COLD PLASMA ON INACTIVATION OF <i>Saccharomyces cerevisiae</i>	83
Petra Matić, Lidija Jakobek ADSORPCIJA DIHIDROKALKONA NA β -GLUKAN ADSORPTION OF DIHYDROCHALCONES ONTO β -GLUCAN.....	84
Sandra Pedisić, Azra Kapo, Ivona Elez Garofulić, Zoran Zorić, Verica Dragović-Uzelac PRIMJENA BILJNIH EKSTRAKATA U PROIZVODNJI FUNKCIONALNIH NAPITAKA APPLICATION OF HERBAL EXTRACTS IN THE PRODUCTION OF FUNCTIONAL BEVERAGES	85
Ivan Tomas, Hrvoje Sučić, Suzana Čavar, Mirela Šimović, Kristina Valek Lendić, Mirta Eberhardt ANALIZA WHEY PROTEINA PRISUTNIH NA PODRUČJU OSJEČKO-BARANJSKE ŽUPANIJE ANALYSIS OF WHEY PROTEIN PRESENT IN THE OSJEK-BARANJA COUNTY.....	86
Benjamin Muhamedbegović, Midhat Jašić, Drago Šubarić, Zoran Iličković, Faik Uzunović, Adnan Čehajić INTERAKCIJE HRANA - METALNA AMBALAŽA INTERACTIONS FOOD - METAL PACKAGING.....	87

Marta Ostojčić, Sanja Brkić, Vanja Beronja, Marina Tišma, Sandra Budžaki MEMBRANSKA FILTRACIJA KAO EKOLOŠKI PRIHVATLJIVIJA METODA PROČIŠĆAVANJA SIROVOG BIODIZELA MEMBRANE FILTRATION AS AN ENVIRONMENTALLY FRIENDLY METHOD FOR CRUDE BODIESEL PURIFICATION.....	88
Jelka Pleadin, Kristina Kvrgić, Nada Vahčić, Snježana Zrnčić, Ana Vulić, Tina Lešić, Natalija Džafić, Dražen Oraić, Greta Krešić UTJECAJ LOKALITETA NA SASTAV MASNIH KISELINA MEDITERANSKE DAGNJE (<i>Mytilus</i> <i>galloprovincialis</i>) IMPACT OF LOCALITY ON FATTY ACIDS COMPOSITION OF THE MEDITERRANEAN MUSSEL (<i>Mytilus galloprovincialis</i>).....	89
Medical chemistry and pharmacy / Medicinska kemija i farmacija	
Elena Gotal, Martina Šrajer Gajdošik, Marija Štivojević, Ana Amić PREGLED BIOLOŠKE AKTIVNOSTI SPOJEVA S OKSADIAZOLSKOM JEZGROM A REVIEW OF BIOLOGICAL ACTIVITY OF COMPOUNDS WITH OXADIAZOLE CORE.....	91
Dejan Agić, Zrinka Karačić, Marija Špoljarević, Miroslav Lisjak, Marija Abramić DIJETETSKI FLAVONOIDI KAO INHIBITORI METALOPEPTIDAZA PORODICE M49 DIETARY FLAVONOIDS AS INHIBITORS OF METALLOPEPTIDASES OF THE M49 FAMILY	92
Ivana Sokol, Mia Krnić, Sandra Liekens, Silvana Raić-Malić, Tatjana Gazivoda Kraljević SINTEZA I ANTIPROLIFERATIVNA AKTIVNOST NOVIH 1,2,3-TRIAZOLNIH DERIVATA KUMARINA I KINOLINA SYNTHESIS AND ANTIPROLIFERATIVE ACTIVITY OF THE NOVEL 1,2,3-TRIAZOLE COUMARIN AND QUINOLINE DERIVATIVES.....	93
Marijana Jukić, Teuta Opačak-Bernardi, Josipa Matić, Biserka Žinić, Ljubica Glavaš-Obrovac PROAPOPTOTIČKI UČINCI NOVIH N-9-SULFONILPURIN-6-AMINSKIH DERIVATA NA TUMORSKE STANICE IN VITRO PROAPOPTOTIC POTENTIAL OF NOVEL N-9-SULFONYLPURINE-6-AMINE DERIVATIVES ON TUMOR CELLS IN VITRO.....	94
Maja Karnaš, Vesna Rastija, Luka Krstulović, Miroslav Bajić, Ivana Stolić, Marijana Jukić, Teuta Opačak-Bernardi, Ljubica Glavaš-Obrovac MOLECULAR DOCKING OF QUINOLONE- ARYLAMIDINE HYBRIDS ON B-DNA DODECAMER DOKIRANJE KINOLIN-ARILAMIDNIH HIBRIDA NA B-DNA DODEKAMER.....	95
Irena Landeka Jurčević, Tajana Frančić, Irena Fabijančić, Domagoj Đikić UTJECAJ POLIFENOLA IZ EKSTRAKTA CVIJETA TRNINE NA DIJABETES TIP 2 U C57BL/6 MIŠA INFLUENCE OF <i>Prunus spinosa</i> L. FLOWER EXTRACT POLYPHENOLS ON TYPE-2 DIABETES MELLITUS IN C57BL/6 MOUSE.....	96
Katarina Mišković Špoljarić, E. Pešut, Gordana Šelo, Ana Bucić-Kojić BIOLOŠKA AKTIVNOST EKSTRAKTA TROPA GROŽĐA <i>in vitro</i> BIOLOGICAL ACTIVITY OF A GRAPE POMACE EXTRACTS <i>in vitro</i>	97
Katarina Mišković Špoljarić, Martina Jakovljević, Stela Jokić PROTUTUMORSKI UČINCI VODENOG EKSTRAKTA ČEŠNJAKA <i>in vitro</i> ANTITUMOUR ACTIVITY OF AN AQUEOUS GARLIC EXTRACT <i>in vitro</i>	98
Ivana Andabaka, Vesna Andrašić, Kristina Miković, Jure Morović KOŽA I PRIMJENA GALENSKIH PRIPRAVAKA NA KOŽU SKIN AND USE OF GALENIC PREPARATIONS.....	99
Chemistry in agriculture and forestry / Kemija u poljoprivredi i šumarstvu	
Vesna Pehar, Davor Oršolić, Višnja Štepanić ODNOSI STRUKTURE I AKTIVNOSTI ZA HERBICIDE STRUCTURE-ACTIVITY RELATIONSHIPS FOR HERBICIDES	101
Vlatka Gvozdić, Dinko Puntarić, Domagoj Vidosavljević, Marina Vidosavljević, Ada Puntarić, Ana Petrović, Miroslav Venus ODREĐIVANJE KONCENTRACIJA ELEMENATA RIJETKIH ZEMALJA U TLU I MASLAČKU (<i>Taraxacum officinale</i>) DETERMINATION OF RARE EARTH ELEMENTS IN THE SOIL AND DANDELION (<i>Taraxacum officinale</i>)	102

Valentina Pavić, Marina Kopic, Mato Drenjančević UTJECAJ DEFOLIJACIJE NA ANTIOKSIDACIJSKU I ANTIBAKTERIJSKU AKTIVNOST EKSTRAKATA POKOŽICE GROŽĐA SORTI MERLOT I FRANKOVKA (<i>Vitis vinifera</i> L.) EFFECTS OF DEFOLIATION ON ANTIOXIDATIVE AND ANTIBACTERIAL ACTIVITY OF GRAPE SKIN EXTRACTS OF MERLOT AND BLAUFRÄNKISCH (<i>Vitis vinifera</i> L.)	103
--	-----

Environmental protection / Zaštita okoliša

Maja Izaković, Valentina Španić, Ema Salopek, Valentina Lukenda, Katarina Galušić, Tihana Marček MORFOMETRIJSKI PARAMETRI I ANTIOKSIDACIJSKI ODGOVOR KLIJANACA PŠENICE IZLOŽENIH SUŠI MORPHOMETRIC PARAMETERS AND ANTIOXIDATIVE RESPONSE OF DROUGHT-EXPOSED WHEAT SEEDLINGS.....	105
---	-----

Marina Palfi, Jasenka Čosić, Nada Knežević ANTIFUNGALNO DJELOVANJE ETERIČNIH ULJA KLINČICEVCA I KADULJE NA RAST MICELIJA <i>Colletotrichum coccodes</i> ANTIFUNGAL ACTIVITY OF CLOVE AND SAGE ESSENTIAL OILS ON THE GROWTH OF MYCELIUM <i>Colletotrichum coccodes</i>	106
--	-----

Vesna Ocelić Bulatović, Lucija Mandić, Anamarija Turković, Dajana Kučić Grgić, Antun Jozinović, Romana Zovko, Emi Govorčin Bajsić BIODEGRADABLE BLENDS OF LOW DENSITY POLYETHYLENE AND THERMOPLASTIC STARCH BIORAZGRADLJIVE MJEŠAVINE POLIETILENA NISKE GUSTOĆE I TERMOPLASTIČNOG ŠKROBA.....	107
--	-----

Nenad Periš, Angela Stipišić, Marija Bralić, Mirjana Čurlin ISPITIVANJE KVALITETE ZRAKA NA PODRUČJU ODLAGALIŠTA OTPADA "KAREPOVAC" DETERMINATION OF AIR QUALITY IN THE AREA OF WASTE LANDFILL "KAREPOVAC"...	108
---	-----

Zdravka Sever Štrukil, Ivana Jakovljević, Gordana Pehnc PROCJENA IZVORA ONEČIŠĆENJA ZRAKA PAU U ZAGREBU KORIŠTENJEM DIJAGNOSTIČKIH OMJERA USING OF PAHs DIAGNOSTIC RATIOS FOR THE ASSESSMENT OF AIR POLLUTION SOURCES IN ZAGREB.....	109
---	-----

Ivana Jakovljević, Ranka Godec, Zdravka Sever Štrukil, Iva Šimić MASENE KONCENTRACIJE PAU, OC I EC U PM1 FRAKCIJI LEBDEĆIH ČESTICA MASS CONCENTRATIONS OF PAH, OC AND EC IN PM1 FRACTION OF PARTICULATE MATTER.....	110
---	-----

Ana Mihaljević, Silva Žužul UTJECAJ VRSTE FILTARSKOG MEDIJA NA GRANICE DETEKCIJE ELEMENATA U ANALIZI LEBDEĆIH ČESTICA U ZRAKU INFLUENCE OF FILTER MEDIA TYPE ON LIMITS OF DETECTION FOR AIR PARTICULATE MATTER ELEMENTAL ANALYSIS.....	111
---	-----

Tomislav Domanovac, Dajana Kučić Grgić, Monika Šabić, Marija Vuković Domanovac BIOLOŠKA OBRADA BIORAZGRADIVE FRAKCIJE IZ MIJEŠANOG KOMUNALNOG OTPADA BIOLOGICAL TREATMENT OF BIODEGRADABLE FRACTION FROM MIXED MUNICIPAL WASTE.....	112
---	-----

Vedran Vučić, Dajana Kučić Grgić, Monika Šabić, Marijana Vidaković, Martina Sudar, Bruno Zelić, Marija Vuković Domanovac RAZVOJ BIOREAKTORSKOG POSTROJENJA ZA KOMPOSTIRANJE BIORAZGRADIVOG KOMUNALNOG OTPADA DEVELOPMENT OF BIOREACTOR PLANT FOR COMPOSTING BIODEGRADABLE MUNICIPAL WASTE.....	113
---	-----

Monika Šabić, Mateja Novak, Dajana Kučić Grgić, Marija Vuković Domanovac BIOSTIMULACIJA PRIRODNO PRISUTNE MIKROBIOLOŠKE ZAJEDNICE U PROCJEDNOJ VODI IZ BIOOTPADRA BIOSTIMULATION OF NATIVE MICROBIAL COMMUNITY IN BIOWASTE LEACHATE.....	114
--	-----

Danijela Ašperger, Josipa Papac, Tibela Landeka Dragičević, Sanja Radman BIORAZGRADNJA ANTIPARAZITIKA U VODI BIODEGRADATION OF ANTHELMINTICS IN WATER.....	115
---	-----

Marjana Simonić, Mirjana Čurlin, Lidija Fras Zemljič OBRADA OTPADNE VODE IZ KOMPOSTANE PROCESOM ELEKTROKOAGULACIJE COMPOST LEACHATE WASTEWATER TREATMENT BY ELECTROCOAGULATION PROCESS	116
---	-----

Dajana Kučić Grgić, Antonija Kovačević, Ema Lovrinčić, Matija Cvetnić, Vesna Očelić Bulatović, Marija Vuković Domanovac BIOREMEDIJACIJA VODE ONEČIŠĆENE BISFENOLOM A BIOREMEDIATION OF WATER POLLUTED WITH BISPHENOL A.....	117
Matija Cvetnić, Lidija Furač, Marinko Markić, Tomislav Bolanča, Šime Ukić, Hrvoje Kušić, Ana Lončarić Božić PREDVIĐANJE BIORAZGRADIVOSTI PRIORITETNIH ONEČIŠĆIVALA U VODI POMOĆU QSAR MODELIRANJA PREDICTION OF BIODEGRADABILITY OF PRIORITY POLLUTANTS IN WATER USING QSAR MODELING.....	118
Marina Vidosavljević, Dinko Puntarić, Vlatka Gvozdić, Domagoj Vidosavljević, Matijana Jergović, Ada Puntarić VRIJEDNOSTI ARSENA U POPULACIJI VINKOVACA METODOM ICP MS ARSENIC IN POPULATION OF VINKOVCI USING ICP MS METHOD.....	119
Tea Štefanac, Toni Šipalo, Dijana Grgas Uhlik, Sanja Radman, Tibela Landeka Dragičević UKLANJANJE P PRI ANOKSIČNIM/OKSIČNIM UVJETIMA P REMOVAL AT ANOXIC/OXIC CONDITIONS.....	120
Z. Lovinčić Kraljević, D. Madunić-Čačić DIFERENCIJALNA POTENCIOMETRIJSKA TITRACIJA: RAZVOJ METODE ZA ODREĐIVANJE PRODUKATA RAZGRADNJE ANIONIJSKIH TENZIJA NASTALIH UV-C/H ₂ O ₂ PROCESOM DIFFERENTIAL POTENTIOMETRIC TITRATION: METHOD DEVELOPMENT FOR DETERMINATION OF ANIONIC SURFACTANT DECOMPOSITION PRODUCTS INCURRED BY UV-C/H ₂ O ₂ PROCESS.....	121
Meeting of young chemists / Susret mladih kemičara	
Domagoj Šubarić, Sanja Lučić Blagojević NANOTEHNOLOGIJA - KOLIKO JE VELIČINA ZAISTA BITNA? NANOTECHNOLOGY - HOW MUCH DOES THE SIZE REALLY MATTER?	123
Dora Čikanović, Petra Mutavdžija, Martina Andić, Marta Martini, Ivan Kolar, Matija Hardi, Kristina Kristek, Karolina Dvojković, Sanja Pavlović Šijanović UTJECAJ VIDLJIVE SVJETLOSTI NA RAST ŠPINATA (<i>Spinacia oleracea</i> L. cv. Matador) THE EFFECT OF VISIBLE LIGHT ON SPINACH GROWTH (<i>Spinacia oleracea</i> L. cv. Matador)	124
Andrea Bilušковиć, Kristina Nikolić, Đurđevka Pecikozić NITRATI I NITRITI U ZELENOM POVRĆU NITRATES AND NITRITES IN GREEN VEGETABLES.....	125
Ramona Janjatović, Lora Kovač, Tea Tonković, Nada Pitinac ANALIZA KVALITETE MEDA HONEY QUALITY ANALYSIS.....	126
Barbara Budim, Barbara Lukić, Maja Stojanović SADRŽAJ SUMPOR DIOKSIDA U BIJELIM VINIMA S PODRUČJA OPĆINE ŽEPČE (BOSNA I HERCEGOVINA) THE SULFUR DIOXIDE CONTENT IN WHITE WINES FROM THE DISTRICT OF ŽEPČE MUNICIPALITY (BOSNIA AND HERZEGOVINA)	127
Lara Paić, Katarina Domjanović, Ljerka Šostarec KOJI SE KEMIJSKI SPOJEVI KRIJU IZA E-BROJEVA U ENERGETSKIM PIĆIMA I GRICKALICAMA WHICH CHEMICAL COMPOUNDS ARE CONCEALED BEHIND E-NUMBERS IN ENERGY DRINKS AND SNACKS.....	128
Lara Vanevski, Dora Purgar, Barbara Bačun, Mario Fröhlich ANKSIOLITIČKO, ANTIDEPRESIVNO I AFRODIZIJSKO DJELOVANJE ETETERIČNIH ULJA ANXIOLITYC, ANTIDEPRESSANT AND APHRODISIAC EFFECTS OF ESSENTIAL OILS.....	129
Lucija Vrbić, Ana Miškić, Marija Jukić, Slavica Jukić PEROKSIDNI BROJ LIPIDA U PRIRODNIM BALZAMIMA PEROXIDE VALUE OF LIPIDS IN NATURAL BALMS.....	130
Antonia Zlatarić, Mario Fröhlich PRIKAZ ISTRAŽIVANJA KAKVOĆE VODE ZA KUPANJE RIJEKE DRAVE NA PODRUČJU OSIJEKA RESEARCH OVERVIEW OF THE WATER QUALITY OF THE BATHING SPOTS OF DRAVA RIVER IN OSIJEK AREA.....	131
Boris Mikulić, Stjepan Jozinović, Slavica Jukić DOBIVANJE ALUMINIJEVA ALAUNA IZ LIMENKE	

OBTAINING POTASSIUM ALUM FROM CANS.....	132
Lovro Jančić, Marijeta Brezetić, Jasminka Žiža	
OD SODE BIKARBONE DO OBNOVLJIVE ENERGIJE	
FROM SODIUM BICARBONATE TO RENEWABLE ENERGY.....	133
Dječji vrtić "Maza" Valpovo	
OVISNICI O KEMIJSKIM SPOJEVIMA U VALPOVAČKOM PARKU.....	134
<i>Author index / Kazalo autora.....</i>	135
<i>Sponsors, donors, exhibitors / Sponzori, donatori, izlagači</i>	141
<i>Programme / Program</i>	

ULTRAZVUČNA EKSTRAKCIJA BIOAKTIVNIH KOMPONENTI IZ KAKAOVE LJUSKE

ULTRASOUND-ASSISTED EXTRACTION OF BIOACTIVE COMPONENTS FROM COCOA SHELL

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Large quantities of solid waste are created during processing of raw materials from plants in the food process industry every year, and their storage, processing, or management present a serious ecological and economic problem. Cocoa shell is only one of the potentially valuable by-products that can be successfully used in the production of extracts rich in bioactive components.

The ultrasound-assisted extraction technique was applied for the extraction of some bioactive components from cocoa shell – a by-product obtained from chocolate industry “Kandit”. Different extraction temperatures (40, 60, 80°C), time (30, 60, 90 min), ultrasonic power (30, 50 70 Hz) and solvent-solid ratio (10, 30 and 50 mL/g) were used to obtain cocoa shell extracts. Some bioactive components, namely methylxanthines (theobromine, theophylline, caffeine), phenolic components (gallic acid, epigallocatechin, catechin, chlorogenic acid, caffeic acid, epicatechin, vanillin) and hydroxymethylfurfural were measured in obtained extracts by high pressure liquid chromatography with diode array detector.

Results showed no presence of hydroxymethylfurfural, theophylline, chlorogenic acid, and vanillin, while other examined bioactive components such as theobromine, caffeine and gallic acid were the most abundant in all cocoa shell extracts.

Significant amounts of specific bioactive components from cocoa shell obtained with one of the newest green technologies today, ultrasound-assisted extraction, have shown that this by-product could be used in further food, pharmaceutical, or cosmetic production.

Keywords: waste, cocoa shell, ultrasound-assisted extraction, bioactive components

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