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Recent studies performed on some tumour cell lines have given proof to the antiproliferative activity of compounds isolated from red wines against tumours. The purpose of this study was to evaluate potential cytotoxic activity of different concentrations of selected Croatian red and white wines on the growth of human normal and tumour cells *in vitro*. Effects on growth of cervical carcinoma (HeLa), colon carcinoma (Caco-2, HT-29), poorly differentiated cells from lymph node metastasis of colon carcinoma (SW-620), larynx carcinoma cells (HEp-2) and normal fibroblasts (WI38) were tested by MTT-assay. Radioactive substrate incorporation tests were used for assessing effects on DNA, RNAs and proteins syntheses. Concentration of polyphenols in wines was assessed according to the method of Singleton and Rossi. Ethanol in the wine concentrates was determined by MS-GC method.

Results of the cytotoxicity test showed that colon carcinoma cells (Caco-2, HT-29), as well as colon carcinoma metastasis (SW620) were the most affected by dealcoholized red wines in concentrations 25% and 12.5% v/v. Amount of total phenols in the red wines was significantly higher (5-10 times) compared to the white wines. The red wine with the greatest polyphenol content was shown to be the most effective. Red wine samples in concentration 25% v/v statistically significantly inhibited the growth of all tested cell lines, including fibroblasts. Tested white wines showed no or negligible growth inhibitory effect against tumour and normal cells. Tumour cells, HeLa and Hep-2, treated by red wine V3 (12.5% v/v) and Hep-2 cells treated by red wine V4 (12.5% v/v) exhibited slightly growth-stimulatory effects. Biosynthesis assay of DNA, RNA and proteins indicated a standstill in the growth of treated cells. Our results indicate that polyphenol-rich domestic wine might have potential pro-therapeutic effect on transformed colonic cells.

Keywords: growth inhibition, human tumour cells, fibroblasts, *in vitro* conditions, wine

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The efficiency of six disinfectants (Nobactel, Domestos, SU 392, Buraton, Descosal, Cidex) was tested against *Staphylococcus aureus* ATCC 6538, *Escherichia coli* ATCC 8739, *Pseudomonas aeruginosa* ATCC 9027, *Candida albicans* ATCC 10231, *Bacillus subtilis* ATCC 6633, *Aspergillus niger* ATCC 16404. Surface test was used in order to evaluate the efficiency of disinfectants during the everyday sanitizing practice on special industrial surfaces. Test organisms represented pathogenic, spore forming bacteria, yeast and mould. Surface test was started with minimal concentration of agents and was not increased above the maximal concentrations, which were recommended by manufacturers in order not to corrode surfaces or risk the safety of use. Test organisms were inoculated on test areas and after drying inoculated surfaces were treated with disinfectants. Six disinfectants were tested and

four were effective against every test organism. (Buraton: 1%, Descosal: 1%, Cidex: 100%, SU 392: 75%). Two disinfectants were ineffective against *Aspergillus niger* (Nobactel: 2%, Domestos: 2%) and 1 against *Staphylococcus aureus* and *Aspergillus niger* (Divomil forte: 2%).

Keywords: disinfectant, sanitation, bacteria, fungi, surface test

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Gillay, B. & Funk, D.: Effects of moisture distribution on measurement of moisture content of dried corn. pp. 171-181. biborka.gillay@uni-corvinus.hu

Drying yellow-dent field corn from harvest moisture levels to safe storage levels is a major cost for producers. This cost can be minimized by precise control of the final moisture content through feed-forward or feedback control. One of the difficulties in achieving control of corn drying is the inaccuracy of dielectric moisture measurements due to non-uniform moisture distributions within kernels after drying. After dried grain has equilibrated for several hours, moisture measurements are somewhat different than immediately after drying. This research examined these effects for yellow-dent field corn over a range of measurement frequencies and drying conditions. Prediction equations relating dielectric constant to moisture content were developed for a range of radio frequencies. The differences between predicted moisture values for recently dried and equilibrated corn were found to be dependent on the measurement frequency and the final moisture content of the grain. For some conditions, particularly for low measurement frequencies and high final moisture contents, predicted moisture contents increased after equilibration. However, predicted moisture values decreased upon equilibration if the final moisture content was near 15 percent, especially if the measurement frequency wasbetween 500 kHz and 10 MHz. Higher measurement frequencies generally yielded smaller predicted moisture differences than lower frequencies.

Keywords: corn moisture, dielectric, drying, moisture rebound, inhomogeneity

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HELYES, L. & LUGASI, A.: Formation of certain compounds having technological and nutritional importance in tomato fruits during maturation. pp. 183-193. lugasi@oeti.antsz.hu

In the present study the concentration of soluble solids (Brix^{o}), total carbohydrate, total organic acid, lycopene, total polyphenol, hydroxymethylfurfural, and antioxidant capacity were investigated in tomato fruits at six ripening stages from mature green to fully red. In case of Brix^{o} and carbohydrate, the highest values were observed at the last stage of ripening. Carbohydrate content constitutes nearly 50% of the soluble solids. In mature green stage the lowest acid content was detected but in subsequent stages it did not change significantly. Polyphenol content remained almost the same during ripening, thus there were not significant differences found among ripening stages. In case of lycopene content, there were great differences among maturity stages. Lycopene accumulated mainly during deep red stage. The antioxidant characteristic of tomato fruit expressed as total antioxidant status (TAS) showed significant linear correlation with lycopene, polyphenol and hydroxymethylfurfural content and increased continuously during ripening period. Marked correlation was observed between lycopene content and formation of hydroxymethylfurfural, as well.

Keywords: tomato, maturity stages, Brix°, carbohydrate, organic acid, lycopene, TAS, hydroxymethylfurfural

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ANDRICH, G., ZINNAI, A., NESTI, U., VENTURI, F. & FIORENTINI, R.: Supercritical FLUID extraction of oil from microalga *spirulina (Arthrospira) platensis*. pp. 195-203. robfior@agr.unipi.it

For the extraction of oil from microalgae, which are recognised as an important renewable source of bioactive lipids, supercritical CO_2 is regarded with interest being safer than hexane and offering a negligible environmental impact, short extraction time and petroleum-free final product. A mathematical model, able to describe the kinetics of a supercritical fluid extraction (SFE) process, was applied to the recovery of oil from the cyanobacterium *Spirulina (Arthrospira) platensis*, characterised by a particularly high contentin g-linolenic acid (C18:3w-6). In this paper, we examine the kinetics of the SFE and the effect of operating conditions on extraction yield and fatty acid composition of lipid extracts.

Keywords: microalgae, *Spirulina (Arthrospira) platensis*, bioactive lipids, g-linolenic acid, supercritical fluids, extraction kinetics

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CSANÁDI, ZS. & SISAK, CS.: Immobilization of pectinex ultra sp-l pectinase and its application to production of fructooligosaccharides. pp. 205-212. sisak@mukki.richem.hu

Pectinex Ultra SP-L, a commercial pectinase with fructosyl-transferase (FTF) activity, is able to catalyze the production of short chain fructooligosaccharides (FOS). It was immobilized onto an anion exchange resin by a combined method. The optimal biocatalyst/matrix ratio (16.7 g enzyme solution / g dry support) as well as the most favourable conditions of the immobilization: the concentration of cross-linking agent (0.125%) and the time of chemical fixation (15 min) have been determined. The temperature and pH optima of the solid-phase biocatalyst have been found 53°C and 5.6, respectively. It showed almost no decrease in its activity during 12 reaction cycles. Based on these results, lab-scale synthesis experiments have been carried out for fructooligosaccharide production under the determined optimal operational conditions.

Keywords: fructooligosaccharides (FOS), fructosyl-transferase (FTF), immobilization

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RAPAVI, E., SZENTMIHÁLYI, K., LUGASI, A., VÁGI, E., BÁNYAI, É., BALÁZS, A., SZŐKE, É. & BLÁZOVICS, A.: The influence of the steeping time on the antioxidant properties of a Chinese herbal tea. pp. 213-222. raperika@freemail.hu

The different methods of making herbal tea used in various cultures may decrease the efficiency of herbal tea, therefore the purpose of the present study was to examine the changes in antioxidant activity and metal ion concentration in aqueous extracts of “Tieguanyin Stomach Tea” obtained with different steeping times. Partial phytochemical examination, element analysis, and the determination of antioxidant properties were carried out. High Al,

Cr, Mn, Ni, Pb and Ti content was observed in the tea drug. Aqueous extracts of the drug sample showed H-donor activity, reducing power and scavenging activity, depending on the steeping time and concentration. According to our findings, 5-min steeping was the least effective and redox parameters of the aqueous extracts did not change considerably between 15 and 120 min of steeping time.

Keywords:polyphenols; flavonoids, steeping time; antioxidant properties; metal ions

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PALÁGYI, ZS., LINKA, B., PAPP, T. & VÁGVÖLGYI, CS.: Isolation and characterization of *Xanthophyllomyces dendrorhous* mutants with altered carotenoid content. pp. 223-228. csaba@bio.u-szeged.hu

Cells of the astaxanthin-producing yeast *Xanthophyllomyces dendrorhous* were subjected to successive 60Co and UV irradiation. Colonies exhibiting increased pigmentation were recovered from different non-selective plates. Mutant strains were subcultured to ensure their genetic homogeneity and their pigment production was characterized. Analysis of the metabolic patterns of 7 pigment-overproducing mutants (derived from 3 wild-type parental isolates) revealed different patterns of carotenoid production: the greatest increase in astaxanthin production (6.7-fold) was found for *X. dendrorhous* strain ATCC 24229/S119 (274 mg g-1 dry weight). Mutant strains with increased total carotenoid content, but without significant change in astaxanthin production, were also isolated.

Keywords: astaxanthin, carotenoid, hyperproducing mutant, *Phaffia rhodozyma, Xanthophyllomyces dendrorhous*

MÉSZÁROS, L., HORTI, K. & FARKAS, J.: Changes of hen eggs and their components caused by non-thermal pasteurizing treatments. I. Gamma irradiation of shell eggs. pp. 229-236. j.farkas@cfri.hu

Shell eggs have been irradiated with increasing radiation doses in the 0.5 – 3.0 kGy dose range and various non-microbiological changes, important from the point of view of consumer quality, have been estimated. Dose-dependent changes in the flow behaviour of egg white and brittleness of the yolk membrane in broken eggs, sensorial parameters of the raw and soft-boiled eggs, whippability and foam stability of the egg white were observed. Considering that a minimal dose of 1.5 kGy would be required for radiation inactivation of salmonellae and other, non-pathogenic bacteria, the quality of irradiated eggs upon such gamma radiation dose would not be equal in all parameters to those of the fresh shell eggs, however, changes in sensorial and functional properties at this dose level may be still acceptable, mainly for risk population and some industrial use.

Keywords: shell eggs, gamma irradiation, functional properties, sensorial properties.

MAGYAR, I. & BENE, ZS.: Morphological and taxonomic study on mycobiota of noble rotted grapes in the Tokaj wine district. pp. 237-246. ildiko.magyar@uni-corvinus.hu

Noble rot of the grape is a complex microbiological-biochemical process having grate importance in the Tokaj wine district. In this study, morphology and development of *Botrytis cinerea* in the berry skin as well as the presence of other moulds and yeasts on the digested exocarp of the noble rotted grapes (aszú) were investigated and presented by scanning electron microscopy. Another aim of this work was a comprehensive taxonomical characterisation of the yeasts present on the surface of the „aszú" berries in the Tokaj wine district in five vintage years. The dominant yeasts were isolated and taxonomically identified according to phenotypical properties. The most prevalent yeast species of the aszú grapes were *Metschnikowia pulcherrima* in the vineyard and *Candida stellata* in the winery (the latter species has been recently differentiated for two species, *C. stellata* and *C. zemplinina)*. These two *Candida* species seem to be typical yeasts of Tokaj aszú berries, particularly after picking, transporting and storage of the aszú grape. These postharvest operations significantly influence mould and yeast populations of botrytized grapes.

Keywords: *Botrytis cinerea*, noble rot, Tokaj, yeasts, aszú, botrytized wines