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Yeast

A Newsletter for Persons Interested in Yeast

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Editorials

Erich Minárik (1924-2007)

I just was about to take the current issue to the printer when I received from Peter Biely the sad news of the passing of Dr. Minárik, co-founder of the International Commission on Yeasts and probably the most assiduous contributor to the YNL. As far as I can remember, he contributed summaries of two, three, or more articles on some aspect of wine fermentation to every issue of the YNL since I took over as Editor roughly 20 years ago. The present issue is no exception (page 9). Dr. Minárik's letters came soon after the mailing of each reminder postcard, in the form of usually two typewritten pages. I have read his summaries with particular attention and was keenly aware of his passion for every detail of wine fermentation and the multitude of environmental factors affecting the performance of yeast in wine. I also had the pleasure of attending a lecture-demonstration on Slovak wine by Dr. Minárik during a meeting taking place at the Smolenice Castle. He will be missed by all who knew him.

Back Issues

Thanks to Dr Kyria Boundy-Mills, who contributed back issues of the Yeast Newsletter all the way to the first issue, prepared by Dr Leslie R. Hedrick in December 1950. Currently, the Yeast Newsletter website offers access to back issues since June 1992. We hope to update our archives so that all issues will eventually be available.

M. A. Lachance, Editor

I Laboratorio de Microbiología y Biotecnología (Laboratory of Microbiology and Biotechnology), Departamento de Química, Facultad de Ingeniería, Universidad Nacional del Comahue. Buenos Aires 1400 (8300) Neuquén, Argentina. Communicated by Christian A. Lopes <clopes@uncoma.edu.ar> http://fain.uncoma.edu.ar/grupos/index.html.

Recent publications.

1 CA Lopes, TL Lavalle, A Querol, and AC Caballero 2006 Combined use of killer biotype and mtDNA-RFLP patterns in a patagonian wine *Saccharomyces cerevisiae* diversity study. Antonie van Leeuwenhoek 89:147-156.

The aim of this work was to characterize the indigenous wine *Saccharomyces cerevisiae* diversity within the Argentinean Patagonia. Two cellars with particular enological practices located in different winegrowing areas were selected and 112 indigenous *S. cerevisiae* isolates were obtained from spontaneous red wine fermentations carried out in them. Thirty-five and 19 patterns were distinguished among the total indigenous isolates using mtDNA-RFLP and killer biotype analysis, respectively. The combination of both typing techniques rendered a higher variability with 42 different patterns, i.e. 42 strains, evidencing a great diversity in *S. cerevisiae* populations associated with spontaneous red wine fermentations in Northwestern Patagonia. The analysis of the relatedness among strains using Principal Coordinates Analysis from combined data allowed the clustering of the strains into two populations significantly related to their origin fermentations. The combined use of the mtDNA-RFLP analysis together with the killer biotype method proved to be a powerful tool in the fingerprinting of the enological *S. cerevisiae* strains.

2 CA Lopes, ME Rodríguez, A Querol, S Bramardi, and AC Caballero 2006 Relationship between molecular and enological features of patagonian wine yeasts: relevance in selection protocols. World J Microbiol Biotechnol 22:827-833.

In this paper, a study of the relationship between genetic patterns, obtained by the combination of mtDNA-RFLP and PCR-amplified inter-d sequence DNA polymorphism analysis, and relevant enological phenotypic data (fermentative power, specific productivity, volatile and total acidity) was carried out on Argentinean *Saccharomyces cerevisiae* isolates from north Patagonia. The use of a powerful statistical tool, Generalized Procrustes analysis, allowed us to weigh the relationship for each isolate in particular, denoting a good enough degree of agreement between molecular and physiological data for most of the population analysed. The inclusion of a physiological feature, as the killer sensitivity biotype, within identification methods resulted in a higher degree of discrimination among isolates and in better correlation between both characterizations. The combined use of methods based on molecular polymorphisms and killer biotype could be applied so as not to miss any isolate with differential enological properties in selection protocols.

3 CA Lopes, ME Rodríguez, M Sangorrín, A Querol, and AC Caballero 2007 Patagonian wines: implantation of an indigenous strain of *Saccharomyces cerevisiae* in fermentations conducted in traditional and modern cellars. J Industrial Microbiol Biotechnol 34:139-149.

In this work we evaluate the implantation capacity of the selected *S. cerevisiae* indigenous strain MMf9 and the quality of the produced wines in a traditional (T) and a modern (M) cellar with diVerent ecological and technological characteristics in North Patagonia (Argentina). Red musts were fermented in 10,000 l vats using the indigenous strain MMf9 as well as the respective controls: a fermentation conducted with a foreign starter culture (BC strain) in M cellar and a natural fermentation in T cellar. Since commercial *S. cerevisiae* starters are always used for winemaking in M cellar and in order to compare the results, natural fermentations and fermentations conducted by the indigenous strain MMf9 were performed at pilot (200 l) scale in this cellar, concomitantly. Thirty indigenous yeasts were isolated at three stages of fermentation: initial, middle and end. The identiWcation of the yeast biota associated to vinifications was carried out using ITS1-5.8S-ITS2 PCR-RFLP. The intra-specific variability of the *S. cerevisiae* populations was evaluated using mtDNA-RFLP analysis. Wines obtained from all fermentations were evaluated for their chemical and volatile composition and for their sensory characteristics. A higher capacity of implantation of the indigenous MMf9 strain was evidenced in the fermentation carried out in M cellar (80% at end stage) than the one carried out in T cellar (40%). This behavior could indicate that each cellar diVers in the diversity of *S. cerevisiae* strains associated to wine fermentations. Moreover a higher capacity of implantation of the native starter MMf9 with regard to the foreign (BC) one was also found in M cellar. The selected indigenous strain MMf9 was able to compete with the yeast biota naturally present in the must. Additionally, a higher rate of sugar consumption and a lower fermentation temperature were observed in vinifications conducted by MMf9 strain with regard to control fermentations, producing wines with favourable characteristics. Even when its implantation in T fermentation was lower than that observed in M one, we can conclude that the wine features from MMf9 fermentations were better than those from their respective controls. Therefore, MMf9 selected indigenous strain could be an interesting yeast starter culture in North Patagonian wines.

Publications in press.

4 MP Sangorrín, CA Lopes, C Belloch, A Querol, and AC Caballero - *Candida patagonica* sp.nov., a new species of yeast from cellar surfaces. Antonie van Leeuwenhoek (online first).

A novel anamorphic yeast species belonging to the genus *Candida* has been isolated from cellar surfaces in North Patagonia. Morphological and physiological observation and phylogenetic analysis were performed. Pseudomycelium was plentifully produced. No sexual reproduction was observed. From sequence analysis of the 26S rDNA D1/D2 region, *Candida bituminiphila* and *Zygoascus hellenicus* were the closest species with 40 and 79 bp substitutions, respectively. *C. bituminiphila* differed physiologically from the novel species in its ability to assimilate sucrose and erythritol, in not fermenting any sugars, in growing without some vitamin compounds, and in growing at 40 °C. All these data support the hypothesis that the new yeast, named *Candida patagonica*, is a novel species related to *C. bituminiphila*. The type strain is UNCOMA 159.5 (= CECT 12029 = CBS 10443).

5 MP Sangorrín, CA Lopes, MR Giraudo, and AC Caballero Diversity and killer behaviour of indigenous yeasts isolated from the fermentation vats surfaces in four Patagonian wineries. Int J Food Microbiol (accepted).

The diversity and killer behaviour of yeast biota associated with four Patagonian wineries surfaces were analyzed in the present study. These wineries were different in their technological and ecological features. Yeast species were identified by pheno and genotyping. Yeast were also characterized using killer sensitivity patterns. Out of 92 isolated yeasts analysed, 25 % were *Saccharomyces cerevisiae;* 18 % were *Kloeckera apiculata* and 11 % were *Pichia anomala*; other six species representing a low percentage were also found. As regards enological practices, the wineries using spontaneous fermentation showed a major percentage of *S. cerevisiae* and a minor percentage of *K. apiculata*. The analysis of the results shows that the *S. cerevisiae* isolates have a higher sensitivity to culture collection yeasts toxins than non-*Saccharomyces* isolates. On the other hand, most of the non-*Saccharomyces* yeasts isolated from fermentation vats are immune to *Saccharomyces* toxins. The present study shows a great heterogeneity in killer behaviour: Killer, 35%, neutral, 25% and sensitive, 40%; and in yeasts species associated with Patagonian wineries surfaces. A particular biota composed mainly by *S. cerevisiae* (57%) and *P. anomala* (37%) was found in the winery located far from the other three wineries.

Previous publications.

6 MP Sangorrín, IE Zajonskovsky, CA Lopes, ME Rodriguez, M van Broock, and AC Caballero 2001 Killer behaviour in wild wine yeasts associated to Merlot and Malbec type musts spontaneously fermented from northwestern Patagonia (Argentina). J Basic Microbiol 41:105-113.

7 P Sangorrín, I Zajonskovsky, M van Broock, and AC Caballero 2002 The use of killer biotyping in an ecological survey of yeast in an old Patagonian winery. World J Microbiol Biotechnol18:115-120.

8 CA Lopes, M van Broock, A Querol, and AC Caballero 2002 *Saccharomyces cerevisiae* wine yeast populations in a cold region in Argentinean Patagonia. A study at different fermentation scales. J Appl Microbiol 93:608-615.

9 ME Rodríguez, CA Lopes, M van Broock, S Valles, D Ramón and A Caballero 2004 Screening and typing of Patagonian wine yeasts for glycosidase activity. J Appl Microbiol 96:84-95.

II Institute of Cryobiology and Food Technology, 53A Cherni Vrah Blvd, 1407 Sofia, Bulgaria. Communicated by Pencho Venkov <PVEN@abv.bg> - <pencho@paastudio.com>

This is a summary of the final report on project NATO SfP 977977 entitled **Improved monitoring of environmental carcinogens by a principally new test**.

Within the framework of its Science for Peace (SfP) programme, the North Atlantic Treaty Organization (NATO) has supported a research project aimed at developing and validation a biological assay for the detection and evaluation of chemicals with carcinogenic potential. This report summarizes the work and achievements during the last 3 years by the laboratories collaborating in the project: Liugi Del Giudice, Institute of Genetics and Biophysics, CNR, Neaples, Italy; Pencho Venkov, Molecular Ecology Department, Institute of Cryobiology and Food Technology, Sofia, Bulgaria; Veneta Groudeva, Biology Faculty, Sofia University Department of Industrial Microbiology;

Dimitar Kantardjiev, National Executive Environmental Agency, Sofia, Bulgaria.

Due to ecologically uncontrolled industrialization and agriculture during last decades, the environment of some countries, including Bulgaria, was polluted with chemicals of unknown origin and effect on humans. Such countries need an easy, cheap and fast test to monitor environmental pollution with special emphasis on carcinogenic pollutants. The aim of the SfP 977977 project was to create by fundamental research and implement in the National System for Environmental Monitoring in Bulgaria a new biological test for detection of environmental carcinogenic pollutants. As such, the **Ty1 test** was developed in the project. The Ty1 test is based on a gene engineered oncogenes – like element (the Ty1 transposon) whose transposition to new places of the *Saccharomyces cerevisiae* genome gives rise to colonies on selective medium. The idea of SfP977977 project was to study the response of Ty1 test to different laboratory carcinogens and mutagens, as well as environmental samples collected from clean and polluted regions in Bulgaria. The results obtained with the Ty1 test were independently proved by the Partners in the project with the study of the same samples in a battery of well known short – term tests and by the analytical chemical analyses of the environmental samples.

The *S. cerevisiae* DG1141ts1 strain was used as tester strain in the Ty1 assay. This strain has the indicator gene HIS3AI (developed by J. Curcio and D. Garfinkel) inserted into a genomic Ty1 of a *S. cerevisiae* strain with deleted HIS3 gene. The reporter gene contains an artificial intron (AI) inserted in the antisense orientation relative to HIS3. Thus, a successful transposition of the engineered Ty1 requires transcription, splicing of AI, reverse transcription of spliced Ty1 – mRNA and insertion the resulting cDNA into a new place of the genome which gives rise to a HIS positive colony on synthetic complete medium without histidine. Since the insertion of cDNA is random, the test gives a quantitative measure of the frequency of Ty1 transposition in the genome as a whole. Although *S. cerevisiae* cells have been used in a variety of systems for detection of mutagens and carcinogens, few of them (if any) have an application in environmental studies. The main reason seems to be the lower response of yeast cells as indicator organism due to low permeability to mutagens/carcinogens. In Ty1 test the low permeability was overcomed by introduction the *ts1* mutation in the tester strain. In previous studies, we found that the *ts1* mutation (allelic to *sec53*) increases cellular permeability by inhibition the glycosilation of mannoproteins building up the most external layer of *S. cerevisiae* cell wall known to limits cellular porosity.

The increased sensitivity of the tester strain to carcinogens (due to increased permeability) was evidenced and the Ty1 test seems equally sensitive to carcinogens when compared to Ames, D7 or other short term assays.

The study of laboratory mutagens and carcinogens in the Ty1 test showed the following results: 1) The test was positive with all 32 studied carcinogens in concentration dependent and kinetics experiments. The Ty1 test gave also positive results with a number of carcinogens that remained undetectable in all other short – term tests evidencing a wider detection specter of the new test. The Ty1 positive chemicals were carcinogens for which different mechanisms of carcinogenicity are supposed in the literature. 2) Pro –carcinogens gave negative results in Ty1 test. They became Ty1 positive after metabolic activation either by S9 mix or by cultivation the tester cells in high (12%) dextrose containing medium. 3) The Ty1 test gave negative results with mutagens that are not carcinogenic, such as 5 – bromuracil, anthracene, NaN_3 etc.

These results suggested that the Ty1 test may have a selective response to carcinogens. Such possibility was studied with pairs of substances that are very similar in structure, however the one being strong carcinogen and the other having only mutagenic activity without being a carcinogen. Benzo(a)pyrene (= carcinogen) and benzo(e)pyrene (= non-carcinogenic mutagen) represent one such pair of substances. The other studied pairs (first the carcinogen, second the noncarcinogenic mutagen) are: benz(a)anthracene and benz(b)anthracene; hexavalent chromium and threevalent cromium; chenodeoxycholic and glycodeoxycholic bile acids; lithoholic and taurocholic bile acids.

The results obtained evidenced the selective response of Ty1 test to carcinogens. The test was positive with substances or heavy metals having carcinogenic properties and remained negative with mutagens or heavy metals without carcinogenic potential. This characteristic has been confirmed in concentration dependent and kinetic experiments. The selectivity of Ty1 test in detection of carcinogens seems very high: for instance, the test is positive with benzo(a)pyrene however gives negative answer with benzo(e)pyrene. Surprisingly, the test can differentiate the carcinogenic (Cr6) from the noncarcinogenic (Cr3) heavy metals even at the level of different valency of the same element.

The applicability of the Ty1 test for monitoring environmental pollution was studied with soil, water and air (filtered dry matter) samples taken 3 times per year during the last two years of the project from regions in Bulgaria declared clean or polluted by the Executive Environmental Agency. Positive responses with Ty1 test were obtained for all samples from polluted regions, while negative results were found for all samples taken from the clean regions. The reliability of Ty1 test as a short term assay for detection of carcinogenic pollutants was proven by the Partners laboratories in the project. First, the environmental samples were studied in a battery of well known bacterial and algae test systems and the results obtained showed positive responses with samples from the polluted regions and negative results with samples from the clean regions, thus repeating the results obtained with the Ty1 test. Second, all environmental samples were chemically analyzed in the laboratories of the Executive Environmental Agency which is the Bulgarian Reference Centre for the European Environmental Agency. Following the requirements and methodology of the European Environmental Agency, all samples were analyzed quantitatively for about 40 parameters, including mutagenic and carcinogenic substances, heavy metals, pesticides etc. The results obtained confirmed the presence of mixtures of carcinogenic chemicals, heavy metals or petrol products in all Ty1 positive samples in quantities above the accepted standards. Contrary, carcinogens were not detected in the Ty1 negative environmental samples taken from the clean regions. Notably, in some of the soil samples from the clean regions, increased amounts of flouranthene (up to130 fold more then the ecological standard) were found. Flouranthene, contrary to the strong carcinogens benzo(a)flouranthene, benzo(i)flourantene and benzo(k)-

flouranthene, is not carcinogenic but has a mutagenic activity. The negative results in the Ty1 test obtained with these samples indicated that the selective positive response of the test to carcinogens found in the study of laboratory substances applies also to environmental samples.

In conclusion, the Ty1 assay is a short – term test for detection of carcinogens. The test is positive with laboratory carcinogens, including such that are undetectable with the other short – term assays. The Ty1 test gives negative answers with mutagens that are not carcinogenic and is probably the first short-term test for selective detection of carcinogens. The test can be applied in environmental monitoring studies for detection of pollution with carcinogenic substances. Based on these results, the Ty1 test was implemented into the National Systems for Environmental Monitoring in Bulgaria.

Although the clarification of the molecular mechanisms of the selective response of Ty1 test to carcinogens was not included into SfP977977 project, we did some preliminary research on this topic. We noticed that the carcinogen-induced transposition of the marked Ty1 element takes place only in cells with functioning mitochondria and all induced transposants were rho^+ (respiratory competent strain). Further we found that the treatment with carcinogens of rho^- (respiratory deficient strain) mutants of the tester strain is without effect on Ty1 transposition, suggesting the involvement of mitochondrial function(s) in the carcinogen induced Ty1 transposition . SCO1 is a nuclear gene whose protein product is required for the functioning of mitochondrial oxidative phosphorylation. We found that destruction of SCO1 gene in the rho^+ tester strain is accompanied with the loss of the carcinogen – induced Ty1 transposition, evidencing that the oxidative phosphorylation but not another mitochondrial function, is involved in the process. The mitochondrial oxidative phosphorylation consists of two main processes: transfer of electrons along the respiratory chain and synthesis of ATP. Although these two processes are coupled, they can be separately inhibited by specific inhibitors. We found that the inhibition of electron transfer by antimycin, leads to complete loss of carcinogen – induced Ty1 transposition in cells with otherwise intact and functioning mitochondria. The inhibition of ATP synthesis with CCCP was without effect. The inhibition of electron's transfer along the respiratory chain is known to increase ROS (reactive oxygen species) and recently evidence is accumulating in the literature that treatment of cells with carcinogens (that are Ty1 positive) enhances ROS level. Therefore, our current working hypothesis is that the increased ROS production in cells treated with carcinogens leads to oxidative damages of genomic DNA which in turn activate the Ty1 transposition, through the DNA damage response pathways. An evidence supporting such way of thinking is the result obtained in experiments with rho^- tester cells previously treated with exogenously added H_2O_2: such cells become capable to respond with increased transposition of Ty1 after treatment with carcinogens.

The following papers have been published, or are in press, in connection to SfP977977.

1 Staleva L, Venkov P 2001 Activation of Ty transposition by carcinogens. Mutat Res 474:93-103

2 Pesheva M, Krastanova O, Staleva L, Dentcheva V, Venkov P 2005 The Ty1 transposition assay: a new short – term test for detection of carcinogens. J Microbiol Methods 61:1-8.

3 Pesheva M, Krastanova O, Stoycheva T, Venkov P, Tsvetkov Ts 2005 Bulg J Agricult Sci 10:221-228.

4 Pesheva M, Venkov P 2005 Dimethylsulfoxide has a recombinogenic effect on *Saccharomyces cerevisiae* cells. Biotechnol Biotechnol Equipment 19:38-42.

5 Stoycheva T, Venkov P, Tsvetkov Ts 2007 Mutagenic effect of freezing on mitochondrial DNA of *Saccharomyces cerevisiae*. Cryobiology (in press).

6 Pesheva M, Stamenova R, Venkov P 2007 Selective response of Ty1 transposition test to carcinogens. Mutat Res (submitted).

7 Stoycheva T, Massardo D.R, Pesheva M, Venkov P, Wolf K, Del Giudice L, Pontieri P 2007 Ty1 transposition induced by carcinogens in *Saccharomyces cerevisiae* yeast depends on mitochondrial function. Gene (in press).

8 Stachkanska G, Ivanova I, Groudeva V, Pencheva E 2005 Culture – dependent approach for determination of microbial diversity in soils from KCM/AGRIA region. Compt Rend Acad Sci Bulg 58:409-416.

9 Stachkanska G, Pencheva E, Atanasova P, Groudeva V, Trifonova R 2005 Microbial diversity in heavy metal polluted waters. Biotech Biotechnol. Equipment 19:61-67.

III Canadian Institute of Fisheries Technology, Dalhousie University, P.O. Box 1000, Halifax, Nova Scotia B3J 2X4, Canada. Communicated by R. Alex Speers <Alex.Speers@dal.ca> http://foodscience.engineering.dal.ca/Faculty/Speers,%20Alex/.

The following are ASBC oral papers to be presented in Victoria in 2007.

1 Lake JC, Porter AV, Gill TA, Speers RA Miniaturizing the fermentation assay: effect of fermenter size and fermentation kinetics on premature yeast flocculation.

This paper reports on fermentation assays used to test the fermentability of malt, especially malt implicated in premature yeast flocculation (PYF). No standard small scale method currently exists. In 1963, the E.B.C. yeast group recommended use of a 5 cm diameter by 102 cm working height fermenter to give a good indication of yeast performance at the brewery scale. When discussing small scale fermenters, Findlay (1971) stated that, "…whatever vessel is used, the column of wort must be at least 50 cm in depth as in shallower vessels insufficient circulation takes place and the yeast falls to the bottom". The current study involved 12ºC fermentations with three vessel configurations, a 4.4 cm high spectrophotometer cuvette, a 12.5 cm high test tube and a 122 cm high 'tall' tube fermenter. Worts tested were made from control and PYF malts. We included in our experiments the method of Jibiki et al. (2006) using wort supplemented with 4% glucose. The Plato decline at 21ºC was fit with a sigmoidal model. The model parameters and fermenter height were used to estimate CO_2 evolution and average turbulent shear rates. We confirmed that both fermenter height and fermentation speed are the major independent variables determining CO_2 evolution and agitation within the fermenting wort. In examining the fermentation data, it was evident that the yeast did not stay equally suspended in all three fermentation vessels. When fermented at 12ºC, yeast fell out of solution rapidly in both the cuvette and test tube fermenters. In the tall tubes, the yeast remained in suspension as expected. The 21ºC test tube fermentations, supplemented with glucose had profiles similar to the 'tall' tube fermentations but were complete in less than 72 hours. It is notable that these profiles could be used to distinguish PYF and control malts. The critical shear rate required to keep yeast suspended was determined to be between 4-7.5s^{-1}. Thus, when downscaling a fermenter test and reducing the fermenter height, the rate of fermentation must be increased to maintain adequate rates of shear. We confirmed that the PYF fermentation assay could be reduced to 15 mL, resulting in reduced labour, time and material costs.

Alex Speers received his graduate education in Food Science at the University of British Columbia, Vancouver, BC. He is Professor in the Food Science and Technology program at Dalhousie University, Halifax, NS, Canada where he instructs students in Brewing Science, Quality Assurance and Food Product Development. In the past, Alex has been employed in the Quality Assurance departments of both Labatt and Molson Breweries. His research interests focus on brewing science and the physical chemistry of various food systems. Dr. Speers' current research interests include various aspects of the brewing process including yeast flocculation, premature yeast flocculation and the properties (and problems created by) beta-glucan and arabinoxylan polymers. He has organized and/or presented brewing workshops in Changzhou, Qingdao and Yangzhou China (1997, 2004, 2005) and Toronto (2002). In the summers of 2001 and 2002 Alex spent a short sabbatical at CUB/Fosters in Melbourne Australia. He formerly instructed at the Siebel Institute of Technology, Chicago, IL Dr. Speers belongs to several professional societies including the ASBC, MBAA and IBD. Alex is a member of the editorial boards of Food Research International, the Journal of the ASBC, the MBAA Technical Quarterly and the Journal of the Institute of Brewing. He has published and presented over 100 papers.

2 Lake JC, Patel JK, Porter AV, Gill TA, Speers RA Investigations on malts causing premature yeast flocculation.

Premature yeast flocculation (PYF) can be qualitatively defined as the early flocculation of yeast from the medium (wort) before the desired consumption of available fermentable sugars, leaving the beer under attenuated. PYF is a sporadic problem in the brewing industry that can cause major monetary losses. However, very little of the underlying mechanisms of PYF are understood. To determine if PYF is caused by metabolic interference of yeast, a novel fermentation assay conducted in cuvettes was employed. Due to insufficient shear in the cuvette, yeast settle immediately. Thus, the cuvette assay eliminated fermentation differences due to variable flocculation patterns of PYF and "normal" wort. Results showed no metabolic differences between the PYF and control worts as monitored by the decline in ºPlato ($p < 0.05$). This led to the hypothesis that PYF is caused by a physical interaction. A small 15 mL fermentation assay capable of segregating PYF malt from "normal" malt was adapted by spiking wort with 4% glucose (w/v) and fermenting at ~21ºC. To determine if PYF activity could be reduced by removing PYF causing "factors", both PYF and control worts were filtered through two different membrane filters (0.45ìm and 100kDa) prior to fermentation. Yeast stayed in suspension longer in PYF wort filtered through the 100kDa membrane compared to unfiltered and 0.45ìm filtered worts. Filtration had no discernable effect on the control wort fermentations. End of fermentation zeta potential measurements of yeast in buffer displayed an interesting pattern, becoming more negatively charged after a 0.45 ìm filtration, but becoming less negatively charged after a 100kDa filtration (Control: Unfiltered=-4.6mV 0.45ìm=-5.9mV 100kDa=-5.1 PYF: Unfiltered=-5.9mV 0.45ìm=-6.1mV 100kDa=-5.2mV).

Joseph Lake obtained an Honours Co-op B.Sc. in marine biology from Dalhousie University, Halifax Nova Scotia in 2004. Joseph is currently working towards a Ph.D. in Food Science and Technology. His research focus is premature yeast flocculation but also includes other yeast/fermentation topics. In the summer of 2005 Joseph had the opportunity to spend four months in industry at Prairie Malt Limited, in Biggar, SK examining barley and malt. He plans to graduate in late 2008.

3 Patel JK, Lake JC, Gill TA, Speers RA Colloidal examinations of yeast fermented in wort causing premature yeast flocculation.

Premature Yeast Flocculation (PYF) is a problem in brewing industry with serious economic implications. This research reports on a study of PYF phenomena through the use of colloidal techniques. A control wort inducing normal flocculation as well as wort causing PYF was fermented for 120 hours in 'tall' tube fermentors. The lager yeast strain used to ferment these two worts (i.e., a control wort and a PYF wort hereafter referred to as 'Control' or 'PYF') was analyzed for cell wall properties: zeta potential (æ), cell separation force (F_r) and orthokinetic capture coefficient (α_0). After 72 hr, upon visual inspection, yeast collected from the PYF wort exhibited more flocculation than the yeast from the control wort. Yeast zeta potential was measured in Control and PYF fermented worts after filtration through 0.2 ìm filter. The PYF yeast showed a less negative surface charge values compared to the Control yeast after 120 hours of fermentation ($p<0.001$). When both yeasts were resuspended in the same 120 hour wort (which has been filtered through a 10 kDa molecular weight cut off filter), there was no difference in surface charge of the control or PYF fermented yeast ($p>.05$). This implied the presence of wort components and/or trub particles larger than 10 kDa caused a reduction in surface charge. Thus, there were less repulsive forces between PYF fermented yeasts presumably encouraging PYF. Interestingly zeta potentials of trub from Control and PYF worts exhibited little differences when suspended in an acetate buffer. The orthokinetic capture coefficients of Control and PYF yeast, were measured in fermented wort as a function of shear rate (18.7 - 465 s^{-1}). There was a significant difference in capture coefficient values between both the yeast suspensions, with the PYF capture coefficient values being higher at 96 and 120 hours of fermentation ($p < 0.05$). Furthermore, the capture coefficients of these suspensions were directly proportional to the inverse of shear rate. The separation force was estimated by examining floc breakup of Control and PYF yeast after passage through a capillary (0.45 mm x 75 mm). The PYF yeast flocs showed higher separation forces compared to Control yeast flocs after 72 hours of fermentation. At 120 hr of fermentation, the Control and PYF yeast separation forces in wort were 3.24×10^{-9} N and 1.52×10^{-8} N respectively. When suspended in a pH 4.0 Sodium acetate buffer the Control and PYF separation forces were 5.87×10^{-9} N and 1.26×10^{-8} N respectively.

IV Comparative Genomics and Bioinformatics, CBS - Fungal Biodiversity Center, Uppsalalaan 8, Utrecht, NL-3584CT The Netherland. Communicated by Ferry Hagen <hagen@cbs.knaw.nl> www.cbs.knaw.nl/research/.

Recent publications.

1 J Lindberg, F Hagen, A Laursen, J Stenderup, and T Boekhout. *Cryptococcus gattii* risk for tourists visiting Vancouver Island, Canada. Emerging Infectious Diseases 13:178-179. The direct link to the full 'Letter to the Editor' is: http://www.cdc.gov/ncidod/EID/13/1/178.htm. The podcast can be found at this internet-location: http://www.cdc.gov/ncidod/eid/podcast/

An unprecedented outbreak of *Cryptococcus gattii* genotype amplified fragment length polymorphism (AFLP) 6/VGII on Vancouver Island, British Columbia, Canada, is affecting both human and animal hosts with normal immunity. So far, >100 human cases, including at least 6 fatalities, have been reported by the British Columbia Centre for Disease Control, (www.bccdc.org, www.cbc.ca). Vancouver Island is a major tourist destination, with ˜7.5 million visits each year (www.bcstats.gov.bc.ca). We report the first known intercontinental transmission of *C. gattii* from this outbreak in a tourist from Denmark who visited Vancouver Island. This case indicates a potential risk for tourism-related acquisition.

2 M Bovers, M Diaz, F Hagen, L Spanjaard, B Duim, C Visser, H Hoogveld, J Scharringa, A Hoepelman, J Fell, and T Boekhout. Identification of genotypically diverse *Cryptococcus neoformans* and *Cryptococcus gattii* isolates using Luminex xMAP technology. J Clin Microbiol - published ahead of print, 18 April 2007, doi:10.1128./JCM.00223-07

A Luminex suspension array, that had been developed for identification *of Cryptococcus neoformans* and *Cryptococcus gattii* isolates, was tested by genotyping a set of 58 mostly clinical isolates. All genotypes of *C. neoformans* and *C. gattii* were included. In addition, cerebrospinal fluid (CSF) obtained from patients with cryptococcal meningitis was used to investigate the feasibility of the technique for identification of the infecting strain. The suspension array identified haploid isolates correctly in all cases. Furthermore, hybrid isolates possessing two alleles of the Luminex probe region could be identified as hybrids. In CSF specimens, the genotype of the cryptococcal strains responsible for infection could be identified after optimization of the PCR conditions. However, further optimization of the DNA extraction protocol is needed to enhance the usability of the method in clinical practice.

V Department of Cell and Organism Biology, Biology Building, Lund University, Sölvegatan 35, 223 62 Lund, Sweden. Communicated by J. Piskur <Jure.Piskur@cob.lu.se> http://www.biol.lu.se/cellorgbiol/yeastandenzymes/publ.html.

Recent publications.

1 Sunnerhagen P, Piskur J (eds.) 2006 Comparative Genomics. Using Fungi as Models. Series: Topics in Current Genetics, Vol. 15. CCLXXXIX, ISBN: 978-3-540-31480-6.

Fungal comparative genomics started in 2000 by the genome sequencing of several yeast species other than the canonical *Saccharomyces cerevisiae*. Since then, over 30 fungal genome sequences have become available. This set represents a total evolutionary divergence comparable to that between vertebrates and arthropods, but also contains closely related genomes. This volume describes how we can use this set of genomes to trace large and small-scale events in genome evolution, to extract information about highly conserved and less conserved sequence elements, and to develop novel methods in genomics that will have an impact on genomics at large.

2 Merico A, Sulo P, Piskur J, Compagno C 2007 Fermentative life style in the *Saccharomyces* complex yeasts. FEBS J 274: 976-989.

3 Evander M, Johansson L, Lilliehorn T, Piskur J, Lindvall M, Johansson S, Almqvist M, Laurell T, Nilsson J 2007 Noninvasive acoustic cell trapping in a microfluidic perfusion system for online bioassays. Anal Chem 79: 2984-2991.

4 Woolfit M, Rozpedowska E, Piskur J, Wolfe KH 2007 Genome survey sequencing of the wine spoilage yeast *Dekkera* (*Brettanomyces*) *bruxellensis*. Eukaryote Cell (in press).

5 Andersen G, Andersen B, Dobritzsch D, Schnackerz KD, and Piskur J 2007 A gene duplication led to specialized gamma-aminobutyrate and beta-alanine aminotransferase in yeast. FEBS J 274: 1804-1817.

6 Piskur J, Schnackerz KD, Andersen G, Bjornberg O 2007 Comparative genomics helps to elucidate novel biochemical pathways. Trends Genet (in press).

7 Kurtzman CP, Piskur J 2006 Taxonomy and phylogenetic diversity among the yeasts. Topics in Current genetics (Comparative genomics using fungi as models, Sunnerhagen P and Piskur J, Eds.) 15:29-46, Springer, Berlin.

VI Biology Department, New University of Ulster, Coleraine, Northern Ireland BT52 1SA. Communicated by R.T. Moore <RT.Moore@ulster.ac.uk>.

Recent publication.

1 Denchev, C. M., Moore, R. T. & Shin, H.-D. 2006. A reappraisal of the genus *Bauhinus* (Microbotryaceae). Mycologia Balcanica 3: 71-75.

The current status of former *Ustilago* species on dicotyledonous plants, recently treated as members of the Microbotryaceae, is discussed. Almaraz et al. (2002) pointed out that the genus *Microbotryum* is restricted to the anthericolous smuts on Caryophyllaceae, based on the sequence analysis of ITS rDNA. They concluded that *Sphacelotheca* and ovariicolous *Microbotryum* species on Caryophyllaceae, or at least, *Microbotryum duriaeanum*, are generically distinct from *Microbotryum* s. str. These results, on the one hand, alter the taxonomic scheme of the Microbotryaceae and, on the other, reestablish the genus name *Bauhinus*, reduced by some recent authors to a synonym of *Microbotryum*, as a correct name. Twenty-six new combinations in *Bauhinus* are proposed: *B. ahmadianus, B. anomalus, B. calandriniicola, B. calyptratae, B. cilinodis, B. coronatus, B. dehiscens, B. dumosus, B. filamenticola, B. lewisiae, B. longisetus, B. ocrearum, B. paucireticulatus, B. perfoliatae, B. picaceus, B. polygoni-alati, B. prostratus, B. radians, B. scabiosae, B. shastensis, B. silybi, B. stewartii, B. tenuisporus, B. tovarae, B. tuberculiformis,* and *B. tumeformis*. A new genus, *Haradaea*, is described to accommodate the seed-destroying species of Ustilago on Caryophyllaceae. It unites seven species: *H. alsineae, H. arenariae-bryophyllae, H. duriaeana, H. holostei, H. jehudanum, H. moenchiae-manticae*, and *H. nivalis*. A key to the genera of the family Microbotryaceae is provided in the text:

1 Spores of two types: thin-walled and longitudinally ridged, and thick-walled and tuberculate: *Zundeliomyces*

1* Spores of the same type 2

2 Peridium and columella in the sori present. Spores at first catenate, joined by disjunctors: *Sphacelotheca*

2* Peridium and columella absent. Spores not catenate . 3

3 Spores produced in cavities in-mixed with filaments:

Liroa

3* Spores not produced in cavities and not mixed with filaments 4

4 Sori in the seeds of species of Caryophyllaceae:

Haradaea

4* Sori in the anthers or anthers and other floral parts of species of Caryophyllaceae:

Microbotryum

4** Sori in various organs of the host plants of different dicotyledonous families, except Caryophyllaceae:

Bauhinus

From its inception the anamorph smut genus *Bauhinus* has been assailed as being unnecessary, dubiously valid, and possibly incorrect and it has, therefore, generally been relegated to synonymy. Denchev, however, has steadfastly been one of its staunch supporters. In an exchange of correspondance with Paul Kirk (CABI), Paul has stated: "I've now had a chance to review the relevant literature and it is my opinion that there has unfortunately been much confusion between what is taxonomic opinion and what is pure nomenclature in this case. The generic name *Bauhinus* R.T.Moore 1992 is validly published and legitimate with type *Uredo tragopogonis-pratensis* Pers. 1797 and included on publication five other species, none of which is the type of a previously published generic name as far as I am aware. That its taxonomic circumscription as defined by some authors may be included in the taxonomic circumscription of an earlier generic name is of no consequence nomenclaturally, being simple taxonomic opinion." This clear analysis succinctly vindicates the name; how the genus is interpreted biosystematically, however, is a matter for the respective students of these fungi.

VII Universität für Bodenkultur, IAM, Muthgasse 18 A-1190 Wien, Austria. Communicated by H. Prillinger <hansjoerg.prillinger@boku.ac.at> http://www.boku.ac.at/

The following is the abstract of a publication in press in FEMS Yeast Research.

1 K Lopandic,[1] H Gangl,[2] E Wallner,[2], G Tscheik,[2] G Leitner,[2] A Querol,[3] N Borth,[4] M Breitenbach,[5] H Prillinger,[1] W Tiefenbrunner[2] Genetically different wine yeasts isolated from Austrian vine-growing regions influence differently wine aroma and contain putative hybrids between *Saccharomyces cerevisiae* and *S. kudriavzevii*.

[1]Austrian Center of Biological Resources and Applied Mycology, Institute of Applied Microbiology, University of Natural Resources and Applied Life Sciences, Muthgasse 18, 1190 Vienna, Austria.
[2]Bundesamt für Weinbau, Gölbeszeile 1, 7000 Eisenstadt, Austria.
[3]Departamento de Biotecnología, Instituto de Agroquímica y Tecnología de Alimentos (CSIC), PO Box 73, 46100 Burjassot, Valencia, Spain.
[4]Institute of Applied Microbiology, University of Natural Resources and Applied Life Sciences, Muthgasse 18, 1190 Vienna, Austria.
[5]University of Salzburg, Department of Genetics and Developmental Biology, Hellbrunnerstrasse 34, 5020 Salzburg, Austria.

To evaluate the influence of the genomic properties of yeasts on the formation of wine flavour, genotypic diversity among natural *Saccharomyces cerevisiae* strains originating from grapes collected in four localities of three Austrian vine-growing areas (Thermenregion: locations Perchtoldsdorf and Pfaffstätten, Neusiedlersee-Hügelland: location Eisenstadt, Neusiedlersee: location Halbturn) was investigated and the aroma compounds produced during fermentation of the grape must of "Grüner Veltliner" were identified. Amplified fragment length polymorphism analysis (AFLP) showed that the yeast strains cluster in four groups corresponding to their geographical origin. The genotypic analysis and sequencing of the D1/D2 domain of 26S rRNA encoding gene and ITS1/ITS2 regions indicated that the Perchtoldsdorf strains were putative interspecies hybrids between *S. cerevisiae* and *S. kudriavzevii*. Analysis of the aroma compounds by gas-chromatography/mass spectrometry indicated a region-specific influence of the yeasts on chemical composition of the wines. The aroma compound profiles generated by the Perchtoldsdorf strains were more related to those produced by the Pfaffstätten strains than by the Eisenstadt and Halbturn strains. Similar to the Pfaffstätten yeasts, the putative hybrid strains were good ester producers, suggesting that they may influence the wine quality favourably.

VIII Central Control and Testing Institute for Agriculture, Matúúkova 21, 833 15 Bratislava, Slovakia. Communicated by E. Minárik.

Recent publications.

1 Minárik E 2007 Influence of selected natural wine yeasts on the style, selling ability on the market. Vinařský obzor 107 (in Slovak).

After oral presentations at the enological symposium in La Rioja (Spain) 2005 a Round Table Discussion took place on the subjects cited above. A great number of wine experts from Europe, USA and Australia attended the meeting. The following subjects were discussed: 1) Wine style and wine yeasts, 2) May selected wine yeasts contribute to the "terroir"?, 3) May an adequate fermentation management influence wine quality?, 4) Are selected wine yeasts less romantic than spontaneous-yeasts? 5) Is there a requirement to use genetically altered yeasts in winemaking?, and 6) Do wine producers participate on the secrecy of their products ? Detailed answers to all subjects are given.

2 Minárik E 2007 Well known yeast strains for red wine fermentation. Vinařský obzor 111 (in Slovak).

Recently the offer of wine yeasts for red wine fermentation on the market has increased. Possibilities to choose the most suitable strains for wineries raised very much. Nearly all strains availableon the market are well accommodated for red wine fermentation. Their application is exceptionally suitable for red wine styles, as well as for deep coloured red wines, e.g., for Dornfelder the strain SIHA 8 or OENOFERM BDX display the best properties. For the production of young wines with a fruity character the strain FERMI ROUGE may be recommended. For wines with full maturity of grapes the strain LALLVIN E or LALLVIN EC 12 are recommended .

3 Minárik E 2007 Behaviour of different yeast strains in mixed wine yeast cultures. Vinařský obzor 100:174.

The dominance of wine yeasts in mixed and pure yeast cultures in the course of alcoholic fermentation of grape must was studied. Advantage of the use of selected yeasts strains compared with spontaneous fermentation is used first of all in large wineries. Mixed pure yeast strains usually offer more complex aromatic properties compared with the use of a single strain. The behaviour of mixed and pure yeasts is elucidated.

IX School of Biological Sciences, University of East Anglia, Norwich NR4 7TJ, England, Communicated by J.A. Barnett <j.barnett@uea.ac.uk>.

Current publications

1 Barnett JA - A history of research on yeasts 10: foundations of yeast genetics. Yeast (in the press).

2 Eddy AA, Barnett JA - A history of research on yeasts 11. The study of solute transport: the first ninety years part 1, simple and facilitated diffusion (sent to journal).

X Laboratorium voor Microbiologie, Wageningen University, Dreijenplein 10, 6703 HB Wageningen, The Netherlands. Communicated by W.J. Middelhoven <Wout.Middelhoven@wur.nl>, <Woutermid@orange.nl>.

Goodbye

Being nearly 72 years of age I decided to retire. Most of my scientific activities during the last 45 years were dedicated to yeasts. In my first years I studied arginine catabolism in baker's yeast and its regulation by nitrogen metabolite repression that was the subject of my PhD thesis.

During the last ten years I was first author of l0 novel yeast species, *viz.* 1 *Blastobotrys sp.*, 3 *Candida* spp., 3 *Cryptococcus* spp.,1 *Hormonema* sp. 1 *Rhodotorula* sp., 1 *Saccharomyces* sp. and 9 *Trichosporon* spp. which followed my first and still best novel species originally described in 1984 as *Trichosporon adeninovorans*, better known as *Arxula adeninivorans*, recently renamed *Blastobotrys adeninivorans*. Nevertheless, I was not a "yeast hunter". My most interesting work was on assimilation of naturally occurring compounds that are not traditionally used in taxonomic growth tests prescribed in identification keys. It was demonstrated that growth tests on uric acid and other purines, amines, phenolic compounds and polysaccharides distinguish yeast taxa, especially *Trichosporon* species that are extremely difficult to distinguish by traditional

growth tests. Assimilation of adenine as sole carbon source seems to be restricted to members of the *Arxula/Stephanoascus/Blastobotrys* clade of ascomycetous yeasts. In spite of these promising results, this work received little appreciation of yeast taxonomists. Several novel species crossed my way when present in enrichment cultures on these compounds. This work demonstrated that the role of yeasts in the carbon cycle is underestimated and that it is both of taxonomic and ecological significance.

Most of the results have been summarized in a chapter entitled "Assimilation of unusual carbon compounds" that soon will appear in a book Diversity and Potential Biotechnological Applications of Yeasts, edited by T Satyanarayana and G Kunze, that will appear in 2007 at Springer Verlag Berlin-Heidelberg-New York.

Methods used in my laboratory have been described in a chapter entitled "Isolation and identification of yeasts" in a book Current Yeast Protocols, Yeast Biochemistry and Biotechnology in Practice, edited by G Gellissen, G Kunze, E Berardi, M.Veenhuis and ID van der Klei, that soon will appear at Wiley-VCH.

In addition to these book chapters, two original papers already appeared:

WJ Middelhoven and W van Doesburg 2007 Utilization of hexamethylenetetramine (urotropine) by bacteria and yeasts. Antonie van Leeuwenhoek 91:191-196. A summary of this paper appeared in the previous ussue of YNL.

WJ Middelhoven and CP Kurtzman 2007 Four novel yeasts from decaying organic matter: *Blastobotrys robertii* sp.nov., *Candida cretensis* sp.nov., *Candida scorzettiae* sp.nov. and *Candida vadensis* sp.nov. Antonie van Leeuwenhoek (appeared online).

The isolation of these species had been reported in previous papers, viz. Folia Microbiologica 49:569-573 (2004) and Antonie van Leeuwenhoek 90:57-67 (2006). *C. cretensis* and *C. vadensis* had been isolated from decaying mushrooms and the other two from rotten wood. *C. cretensis* was the only of the four type strains that displayed fermentative activity. All four type strains grew on *n*-hexadecane. *C. scorzettiae* was the only one of the new species that assimilated some phenolic compounds, viz. 3-hydroxy derivatives of benzoic, phenylacetic and cinnamic acids, but not the corresponding 4-hydroxy acids.

XI State Scientific-Research Institute for Genetics and Selection of Industrial Microorganisms (GosNIIgenetika), I-Dorozhnyi 1, Moscow 117545, Russia. Communicated by G.I. Naumov and E.S. Naumova <gnaumov@yahoo.com>.

The following are publications for 2006, 2007, or in press.

1 Naumov GI, Naumova ES, Kondratieva VI 2006 The use of hybridization in breeding of eukaryotic microorganisms. Russian J Genet 42):1324-1328.

The article deals with the genetic bases of breeding of eukaryotic microorganisms. Using the data on the *Saccharomyces* yeasts, application of different genetic approaches and methods to breeding is discussed, including interstrain, interlinear, and distant interspecific hybridization, as well as heterosis, polyploidy, cytoduction, and meiotic recombination.

2 Ivannikova YuV, Naumova ES, Martynenko NN, Naumov GI 2007 Characterization of the genome of *Saccharomyces* yeasts from red berry wines. Microbiology (Moscow), 76:194-204.

3 Glushakova AM, Ivannikova YuV, Naumova ES, Chernov IYu, Naumov GI 2007 Massive isolation and identification of *Saccharomyces paradoxus* yeasts from plant phyllosphere. Microbiology (Moscow), 76:205-210.

4 Naumov GI, Vasilieva SA, Chernov IYu 2007 Aerobic maltose utilization in the yeast *Saccharomyces paradoxus*, *S. mikatae*, *S. kudriavzevii* and *S. cariocanus*. Mikologiya i Fitopatologiya (in Russian), in press.

Natural strains of *Saccharomyces paradoxus, S. mikatae, S. kudriavzevii* and *S. cariocanus* can assimilate maltose, but ferment it during 4-9 days. Mitochondrial respiratory-deficient mutations were shown to block maltose utilization in all 48 strains studied. Low-affinity maltose transport is probably depended on respiration. This phenomenon for yeasts is known as Kluyver effect.

5 Sukhotina NN 2007 Genosystematics of the yeast *Kluyveromyces*. PhD Thesis, GosNIIgenetika, Moscow.

XII Department of Microbiology, Institute of Applied Molecular Biology, Saarland University, Postfach 151150, Building A 1.5, D-66041 Saabrücken, Germany. Communicated by M.J. Schmitt <mjs@microbiol.uni-sb.de>.

The following is a summary of a recently published paper of the group.

1 Powilleit F, Breinig T & Schmitt MJ (2007). Exploiting the yeast L-A viral capsid for the *in vivo* assembly of chimeric VLPs as platform in vaccine development and foreign protein expression. *PLoS ONE* 2(5): e415.doi:10.1371/journal.pone.0000415.

A novel expression system based on engineered variants of the yeast (*Saccharomyces cerevisiae*) dsRNA virus L-A was developed allowing the *in vivo* assembly of chimeric virus-like particles (VLPs) as a unique platform for a wide range of applications. We show that polypeptides fused to the viral capsid protein Gag self-assemble into isometric VLP chimeras carrying their cargo inside the capsid, thereby not only effectively preventing proteolytic degradation in the host cell cytosol, but also allowing the expression of a *per se* cytotoxic protein. Carboxyterminal extension of Gag by T cell epitopes from human cytomegalovirus pp65 resulted in the formation of hybrid VLPs that strongly activated antigen-specific CD8+ memory T cells *ex vivo*. Besides being a carrier for polypeptides inducing antigen-specific immune responses *in vivo*, VLP chimeras were also shown to be effective in the expression and purification of (i) a heterologous model protein (GFP), (ii) a *per se* toxic protein (K28 α-subunit), and (iii) a particle-associated and fully recyclable biotechnologically relevant enzyme (esterase A). Thus, yeast viral Gag represents a unique platform for the *in vivo* assembly of chimeric VLPs, equally attractive and useful in vaccine development and recombinant protein production.

XIII Dipartimento di Biologia Vegetale e Biotecnologie Agroambientali, Sezione di Microbiologia Applicata, Università di Perugia, Borgo XX Giugno 74, I 06121 Perugia, Italy. Communicated by Pietro Buzzini <e-mail pbuzzini@unipg.it>.

List of papers.

1 Buzzini P, Gasparetti C, Turchetti B, Cramarossa MR, Vaughan-Martini A, Martini A, Pagnoni UM, Forti L. Production of volatile organic compounds (VOCs) by yeasts isolated from the ascocarps of black (*Tuber melanosporum* Vitt.) and white (*Tuber magnatum* Pico) truffles. Arch. Microbiol, 184, 187-193, 2005.

2 Romani A, Ieri F, Turchetti B, Mulinacci N, Vincieri FF, Buzzini P. Analysis of condensed and hydrolysable tannins from commercial plant extracts. J. Pharm. Biomed. Anal., 41, 415-420, 2006.

3 Gasparetti C, Buzzini P, Cramarossa MR, Turchetti B, Pagnoni UM, Forti L. Application of the response surface methodology (RSM) for optimizing the production of volatile organic compounds (VOCs) by *Trichosporon moniliiforme*. Enzyme Microb. Technol., 1341-1346, 2006.

4 de García V, Brizzio S, Libkind D, Buzzini P, van Broock M. Biodiversity of cold-adapted yeasts from glacial meltwater rivers in Patagonia, Argentina. FEMS Microbiol. Ecol., 59, 331-341, 2006.

5 De Nicola R, Corte L, Lattanzi M, Martini A, Fatichenti F, Cardinali G. Correlation among phenotypical and molecular techniques in comparing ascomycetous yeast type strains. Riv. Biol., 2005, 98, 449-67.

6 Corte L, Rellini P, Sciascia F, De Nicola R, Fatichenti F, Cardinali G. Distribution and correlation of three oenological traits in *Saccharomyces cerevisiae*. Ann. Microbiol., 2006, 56, 19-23.

7 Zadra C, Cardinali G, Corte L, Fatichenti F, Marucchini C. Biodegradation of the fungicide iprodione by *Zygosaccharomyces rouxii* strain DBVPG 6399. J Agric. Food Chem., 2006, 54, 4734-4739.

8 Siccardi D, Rellini P, Corte L, Bastoni F, Fatichenti F, Cardinali G. General evidence supporting the hypothesis that *Saccharomyces cerevisiae* vaginal isolates originate from food industrial environments. The new Microbiologica 2006, 29, 201-206.

9 Corte L, Rellini P, Lattanzi M, Picchetta C, Fatichenti F, Cardinali G. Diversity of salt response among yeast. Ann. Microbiol., 2006, 56, 363-368.

XIV Laboratorio de Microbiología Aplicada y Biotecnología (Applied Microbiology and Biotechnology Lab.), Centro Regional Universitario Bariloche, Universidad Nacional del Comahue. Quintral 1250, (8400), Bariloche, Argentina. Communicated by Diego Libkind <libkind@crub.uncoma.edu.ar>.

Recent Publications.

1 de García V, Brizzio S, Libkind D, Buzzini P, van Broock M 2007 Biodiversity of cold-adapted yeasts from runoff glacial rivers in Patagonia, Argentina. FEMS Microbiol Ecol 59:331-341.

2 Libkind D, Ruffini A, van Broock M, Alves L, Sampaio JP 2007 Biogeography, host-specificity, and molecular phylogeny of *Phaffia rhodozyma* and its sexual form, *Xanthophyllomyces dendrorhous.* Appl Environ Microbiol 73:1120-1125.

Publication in press.

3 Brizzio S, Turchetti B, de García V, Libkind D, Buzzini P, Gasparetti C, van Broock M 2007 Extracellular enzymatic activities (EEA) in basidiomycetous yeasts isolated from glacial and subglacial waters of northwest Patagonia (Argentina). Can J Microbiol

Meetings.

Our laboratory organized the 1st Patagonic Meeting on Yeast Biology (I Jornadas Patagónicas de Biología de Levaduras) held in the Universidad Nacional del Comahue, Bariloche, Argentina during 17 and 18 of May. The book of abstracts (in Spanish) is available upon request or can downloaded from:

http://www.crub.uncoma.edu.ar/wp-content/uploads/2007/05/libro-jornadas-2007.pdf.

XV Institut Curie, Section de Recherche, Université Paris XI, Orsay 91405, France. Communicated by Hiroshi Fukuhara <hiroshi.Fukuhara@curie.u-psud.fr>.

FEMS Yeast Research thematic issue for *Kluyveromyces lactis* will appear in the volume 7-5 (August 2007). The issue contains the following articles.

1 MA Lachance - Current status of *Kluyveromyces* systematics. Invited MiniReview.

2 T Lodi, J Diffels, A Goffeau and PV Baret - Evolution of the carboxylate JEN transporters in fungi.

3 You-Fang Li and Weiguo-Bao - Why do some yeast species require niacin for growth? Different modes of NAD synthesis.

4 GD Clark-Walker - The F1-ATPase inhibitor Inh1 (IF1) affects suppression of mtDNA loss-lethality in *Kluyveromyces lactis*.

5 L Tizzani, M Wésolowski-Louvel, V Forte, F Romitelli, F Salani, M Lemaire, H Neil and M. Bianchi - Mutations of *RAG3* gene encoding a regulator of fermentation in *Kluyveromyces lactis*, are suppressed by a mutation of the transcription factor gene *KlGCR1*.

6 K Kettner, E-C Müller, A Otto, G Rödel, KD Breunig and TM Kriegel - Identification and characterization of a novel glucose phosphorylating enzyme in *Kluyveromyces lactis*.

7 M Saliola, C Getuli, C Mazzoni, I Fantozzi and C Falcone - A new regulatory element mediates ethanol repression of *KlADH3*, a *Kluyveromyces lactis* gene coding for a mitochondrial alcohol dehydrogenase.

8 M Blanco, L Núñez, N Tarrío, E Canto, M Becerra, MI González-Siso and ME Cerdán - An approach to the hypoxic and oxidative stress responses in *Kluyveromyces lactis* by analysis of mRNA levels.

9 E Marchi, T Lodi and C Donnini - *KNQ1*, a *Kluyveromyces lactis* gene encoding a transmembrane protein may be involved in iron homeostasis.

10 C Mehlgarten, S Zink, J Rutter and R Schaffrath - Dosage suppression of the *Kluyveromyces lactis* zymocin by *Saccharomyces cerevisiae ISR1* and *UGP1*.

11 D Uccelletti, S Anticoli and C Palleschi - The apyrase *KlYnd1p of Kluyveromyces lactis* affects glycosylation, secretion and cell wall properties.

12 L Ongay-Larios, R Navarro-Olmos, L Kawasaki, N Velázquez-Zavala, E Sánchez-Paredes, F Torres-Quiroz, G Coello and R Coria - *Kluyveromyces lactis* sexual pheromone. Gene structure and cellular response to α-factor.

XVI Russian Collection of Microorganisms (VKM), Institute for Biochemistry and Physiology of Microorganisms, Pushchino, 142290, Russia. Communicated by WI Golubev <wig@ibpm.pushchino.ru>.

The following papers have appeared recently.

1 Golubev WI, Golubeva EW 2006 Mycocinotyping of Filobasidiaceous species in the genus *Cryptococcus*. Mykologiya i Phytopathologiya 40:480-486.

Biotyping of filobasidiaceous *Cryptococcus* species and *Filobasidium* species by differential sensitivity to a panel of mycocinogenic hymenomycetous yeasts was proposed. Almost each of species examined has unique mycocin sensitivity profile except for several species closely related phylogenetically. The data obtained suggest that known Filobasidiaceous cryptococci are not asexual states of *Filobasidium* species described. Contrary to epiphytic yeasts, soil yeasts are sensitive to much more number of mycocins.

2 Kulakovskaya EV, Kulakovskaya TV, Golubev WI, Shashkov AS, Grachev AA, Nifantiev NE 2007 Fungicidal activity of cellobiose lipids secreted by the yeasts *Cryptococcus humicola* and *Pseudozyma fusiformata*. Bioorganicheskaya khimiya 33:167-171.

Cellobiose lipids of *C. humicola* and *P. fusiformata* have similar activity against various yeasts, including pathogenic species of the genera *Cryptococcus* and *Candida*. Basidiomycetous yeasts are more sensitive to these glycolipids, e.g. almost all *Filobasidiella neoformans* cells die after 30-min incubation at cellobiose lipid concentration of 0.02 mg/ml. The same effect for ascomycetous yeasts is achieved at five to eight times higher concentrations. Unlike *C. humicola* cellobiose lipid, the cellobiose lipid of *P. fusiformata* has hydroxycaproic acid residue as O-subtituent of cellobiose and additional 15-hydroxy group in aglycone, and it inhibits the growth of *Sclerotinia sclerotiorum* more efficiently.

XVII Department of Biology Faculty of Medicine Masaryk University, Tomesova 12, 602 00 Brno, Czech Republic. Communicated by Marie Kopecká <mkopecka@med.muni.cz> http://www.med.muni.cz/biologie/.

Papers.

1 M Gabriel, M Kopecká, M Yamaguchi, A Svoboda, K Takeo, S Yoshida, M Ohkusu,TSugita, T Nakase 2006 Cytoskeleton in the unique cell reproduction by conidiogenesis of the long neck yeast *Fellomyces (Sterigmatomyces) fuzhouensis.* Protoplasma 229:33-44.

The morphology of conidiogenesis and associated changes in microtubules, actin distribution and ultrastructure were studied in the basidiomycetous yeast *Fellomyces fuzhouensis* by phase-contrast, fluorescence, and electron microscopy. The interphase cell showed a central nucleus with randomly distributed bundles of microtubules and actin, and actin patches in the cortex. The conidiogenous mother cell developed a slender projection, or stalk, that contained cytoplasmic microtubules and actin cables stretched parallel to the longitudinal axis and actin patches accumulated in the tip. The conidium was produced on this stalk. It contained dispersed cytoplasmic microtubules, actin cables, and patches concentrated in the cortex. Before mitosis, the nucleus migrated through the stalk into the conidium and cytoplasmic microtubules were replaced by a spindle. Mitosis started in the conidium, and one daughter nucleus then returned to the mother via an eccentrically elongated spindle. The cytoplasmic microtubules reappeared after mitosis. A strong fluorescence indicating accumulated actin appeared at the base of the conidium, where the cytoplasm cleaved eccentrically. Actin patches then moved from the stalk together with the retracting cytoplasm to the mother and conidium. No septum was detected in the long neck by electron microscopy, only a small amount of fine "wall material" between the conidium and mother cell. Both cells developed a new wall layer, separating them from

the empty neck. The mature conidium disconnected from the empty neck at the end-break, which remained on the mother as a tubular outgrowth. Asexual reproduction by conidiogenesis in the long-neck yeast *F. fuzhouensis* has unique features distinguishing it from known asexual forms of reproduction in the budding and fission yeasts. *Fellomyces fuzhouensis* develops a unique long and narrow neck during conidiogenesis, through which the nucleus must migrate into the conidium for eccentric mitosis. This is followed by eccentric cytokinesis. We found neither an actin cytokinetic ring nor a septum in the long neck, from which cytoplasm retracted back to mother cell after cytokinesis. Both the conidium and mother were separated from the empty neck by the development of a new lateral wall (initiated as a wall plug). The cytoskeleton is clearly involved in all these processes.

2 David M, Gabriel M, Kopecká M 2007 Microtubular and actin cytoskeletons and ultrastructural characteristics of the potentially pathogenic basidiomycetous yeast *Malassezia pachydermatis*. Cell Biol Int 31:16-23.

Microtubular and actin cytoskeletons were investigated in the lipophilic yeast *Malassezia pachydermatis* by fluorescence and electron microscopy. To detect microtubules by indirect immunofluorescence using monoclonal anti-tubulin antibody, a prolonged incubation with lysing enzymes was necessary due to its very thick cell wall. Cytoplasmic microtubules were detected in interphase and a spindle with astral microtubules was seen in M-phase. The disintegration of cytoplasmic microtubules and migration of the nucleus to the bud before mitosis were characteristic features of the basidiomycetous yeast *Malassezia pachydermatis.* The visualisation of F-actin structures (patches, cables and cytokinetic rings) by fluorescence microscopy using both monoclonal anti-actin antibody and rhodamine-phalloidin failed, but actin was detected by electron microscopy with immunogold labelling. Clusters of gold particles indicating actin structures were detected at the plasma membrane of cells with unique cortical ultrastructural features characteristic of the genus *Malassezia*. A possible association of these with the actin cytoskeleton is suggested.

3 David M, Gabriel M, Kopecká M 2007 Cytoskeletal structures, ultrastructural characteristics and the capsule of the basidiomycetous yeast *Cryptococcus laurentii.* Antonie van Leuuwenhoek 92:29-36.

The cytoskeleton, capsule and cell ultrastructure were studied during the cell cycle of *Cryptococcus laurentii*. In an encapsulated strain, cytoplasmic microtubules and a mitotic spindle were detected. Mitosis was preceded by migration of the nucleus into the bud. F-actin failed to be visualized by rhodamine-phalloidin in encapsulated cells and therefore an acapsular strain was used. The following actin structures were found: actin dots, actin cables and cytokinetic ring. Ultrastructural studies showed the presence of a nucleus in the bud before mitosis. A collar-shaped structure was seen at the base of bud emergence. A lamellar cell wall and a rough outer surface of the cells were detected. Cytoskeletal structures found in *Cryptococcus laurentii* are similar to those in *Cryptococcus neoformans*, which is a serious human pathogen.

4 Kopecká M., Gabriel M, Takeo K, Yamaguchi M, Svoboda A, Hata K 2003 Analysis of microtubules and F-actin structures in hyphae and conidia development of the opportunistic human pathogenic black yeast *Aureobasidium pullulans.* Microbiology (UK) 149:865-876.

Organization of the cytoskeleton was studied in the ascomycetous black yeast *Aureobasidium pullulans*, an opportunistic human pathogen, in an effort to present it as a potential target of antifungal therapy. Long cytoplasmic microtubules, extending along the hyphae from the base to the growing apex, were the dominant structures in multinucleate interphase cells. Before mitosis these microtubules disappeared and were replaced by intranuclear spindles. This reorganization of microtubules occurred along the whole length of hypha before synchronous division of the nuclei. Actin cytokinetic rings were rarely seen. Cortical actin in the form of patches accumulated in areas of cell wall growth, i.e. in the hyphal apex and near the occasionally formed septum. Actin cables were not seen. During synchronous conidiogenesis, the cytoplasmic microtubules extended along developing conidia, and actin patches lined their subcortical areas. Actin rings were formed regularly at the base of uninuclear conidia. Microtubule inhibitor methyl *N*-(5-benzoyl-1*H*-benzimidazol-2-yl) carbamate disintegrated the microtubules, and inhibited nuclear division, development of hyphae and conidiogenesis. Actin inhibitor Cytochalasin D induced swelling of hyphal apexes and developing conidia. This inhibitory activity ceased after 5 to 12 h when the occasional septa appeared and conidiogenesis was completed. The lack of unicellular organization in multinucleate hyphae of *A. pullulans* seems be related to a rarity of F-actin structures: i.e. absence of actin cables, the lack of actin cytokinetic rings in particular, resulting in the uncoupling of the nuclear division from cytokinesis; the association of both processes is, however, retained during conidiogenesis.

5 Kopecká M, Gabriel M, Takeo K, Yamaguchi M, Svoboda A, Ohkusu M, Hata K, Yoshida S 2001 Microtubules and actin cytoskeleton in *Cryptococcus neoformans* compared with ascomycetous budding and fission yeasts. Eur J Cell Biol 80:303-311.

Actin cytoskeleton and microtubules were studied in a human fungal pathogen, the basidiomycetous yeast *Cryptococcus neoformans* (haploid phase of *Filobasidiella neoformans)*, during its asexual reproduction by budding using fluorescence and electron microscopy. Staining with rhodamine-conjugated phalloidin revealed an F-actin cytoskeleton consisting of cortical patches, cables and cytokinetic ring. F-actin patches accumulated at the regions of cell wall growth, i.e. in cylindrical sterigma-like protrusion, bud and septum. In mother cells evenly distributed F-actin patches were joined to F-actin cables, which were directed to the growing sterigma-like protrusion and bud. Some F-actin cables were associated with the cell nucleus. The F-actin cytokinetic ring was located in the bud neck, where the septum originated. Anti-tubulin TAT1 antibody revealed a microtubular cytoskeleton consisting of cytoplasmic and spindle microtubules. In interphase cells cytoplasmic microtubules pointed to the growing sterigma-like protrusion and bud. As the nucleus was translocated to the bud for mitosis, the cytoplasmic microtubules disassembled and were replaced by a short intranuclear spindle. Astral microtubules then emanated from the spindle poles. Elongation of the mitotic spindle from bud to mother cell preceded nuclear division, followed by cytokinesis (septum formation in the bud neck). Electron microscopy of ultrathin sections of chemically fixed and freeze-substituted cells revealed filamentous bundles directed to the cell cortex. The bundles corresponded in width to the actin microfilament cables. At the bud neck numerous ribosomes accumulated before septum synthesis. We conclude: *(i)* the topology of F-actin patches, cables and rings in *C. neoformans* resembles ascomycetous budding yeast *Saccharomyces,* while the arrangement of interphase and mitotic microtubules resembles ascomycetous fission yeast *Schizosaccharomyces*. The organization of the cytoskeleton of the mitotic nucleus, however, is characteristic of basidiomycetous yeasts. *(ii)* A specific feature of *C. neoformans* was the formation of a cylindrical sterigma, characterized by invasion of F-actin cables and microtubules, followed by accumulation of F-actin patches around its terminal region resulting in development of an isodiametrical bud.

XVIII Institute of Fermentation Technology and Microbiology, Technical University of Lodz, 90-924 Lodz, Wolczanska 171/173, Poland. Communicated by D. Kregiel <dkregiel@p.lodz.pl>, A. Czyzowska, E. Kordialik-Bogacka, J. Laskowska, and W. Ambroziak.

Invited lecture on 35th Annual Conference on Yeast, 16-18 May 2007, Smolenice, Slovakia.

1 Kregiel D, Berlowska J, Ambroziak W Surface charge and hydrophobicity of selected yeasts strains from different physiological states.

There are today a lot of different materials, which have a porous structure and opportunity to deposit the electrical charge on the surface and can be used as the carriers for immobilization of the microorganisms. Therefore a critical first step of adhesion in immobilization procedure is microbial surface charge, which is in accordance with the needs for optimum interaction between the surface of carrier and surface of concrete microorganism. Determination of this charge is important in understanding and modelling of cells behaviour and function in immobilized state during various conditions of fermentation processes. Examination of the yeast surface charge and hydrophobicity of selected yeast strains derived from different physiological condition was a goal of our research. Experiments were performed with conventional distillery and brewery yeasts of *Saccharomyces cerevisiae* and unconventional amylolytic yeast strain of *Debaryomyces occidentalis*. Yeast cells were cultured in wort broth (Merck) at 25^0C with constant shaking and measurements were done at log phase of growth, at the beginning of stationary phase, after 24 hours starvation in Ringer solution and after 7-days fermentation trail. Relative yeast surface charge was evaluated by attachment of cells to Sephadex ion-exchangers and by Alcian Blue staining. Hydrophobicity was measured by the cells retention in xylene layer. When the yeast surface charge was determined by the method of alcian blue (AB) adhesion it was evident that all analyzed yeast strains from different phases of growth were naturally negatively charged, but the extent of AB adhesion was depended on physiological state of yeast strains. The more evidence of negative yeast surface charge came from experiments with yeast cells grown in exponential and stationary phase, which bound almost exclusively to DEAE-Sephadex ion-exchanger with above 99.8% yield for normal condition and above 96% yield for cells previously kept in starvation state during 24h. The yeast surface charge changed significantly from log to stationary phase and was affected also by starvation and fermentation. Maximal negative charge was observed for yeast population from stationary phase of growth. The obtained results have shown how culture age and environmental condition can effect the cellular adhesion on solid carrier and how to choose suitable carrier or how to modified it surface for yeast immobilization in particular fermentation processes.

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Posters presented on 35th Annual Conference on Yeast, 16-18 May 2007, Smolenice, Slovakia.

2 Berlowska J, Kregiel D, Ambroziak W - Adhesion of selected yeast strains and stability of cell-carrier system during alcohol fermentation.

Cell adhesion is the fundamental phenomenon that governs and describes bioengineering processes that employ immobilized microorganisms in different biotechnological applications, including beer and biofuel production. The physiological state of adhered cells, their phase of growth and nutrient availability, microtopography of the contact surface are

important in determining the adhesion process, and than biotechnological performance. Specific object of our research was to study how the immobilization conditions (medium type, incubation time, yeast physiological state, phase of growth) can effect attachment of yeast cells. Industrial brewery and distillery yeast strains of *Saccharomyces cerevisiae* and amylolytic strain of *Debaryomyces occidentalis,* were immobilized on porous carriers made from hydroxyapatite (HAP) or chamotte. Microorganisms previously incubated in different conditions were immobilized by the standard or dry method and under normal or starvation condition. All experiments were done at 30^0C. The effectiveness of adhesion was evaluated by microscopic method and adhered yeast cells staining with methylene blue and/or DAPI. Yeast cells staining with DAPI has shown a high linear correlation ($R^2 > 0,95$) between log of yeast cell number and DAPI fluorescence intensity for all strains what permit to use this method for analytical proposes of numbering the cell amount. In all cases observed yeast strains immobilization on HAP was weak with no significant differences between cell density and the rate of adhesion. The higher adhesion rate and higher stability of cell-carrier system were observed, especially in the case of *D. occidentalis,* in no favorite for yeasts conditions – starvation, stress, minimal medium Therefore we postulate that for HAP yeast adhesion has only reversible character. The better results were seen in the case of chamotte, but formation of three-dimensional structure and microcolonies of adhered cells ware not seen. Stability of cell-carrier attachment was much higher for chamotte, on which, depending on immobilization condition, 60-98% recovery of previously adhered cells was seen after 7 days of mini-fermentation trials. The optimal adhesion condition is a individual future of each yeast strain and should be determined for the type of use carrier and fermentation process.

This research was supported by 6th FP grant PERCERAMICS –NMP3-CT-2003.

3 Okrajni J, Zboromirska-Wnukiewicz B, Koziol G, Ambroziak W - Electrokinetic potential of yeast cell and solid carrier surfaces and yeast immobilization.

Immobilized cells are increasingly being used in bio-industries due to numerous advantages. The enhanced fermentation productivity, cell stability, feasibility of continuous processing, and lower cost of recovery, recycling and downstream processing is the most important. To achieve fast reaction rates in bioreactors with immobilized cells, the microorganisms must be retained at high cell concentration. In attemps to increase cell concentration, the scientists focus on the study of the electrokinetic properties of cells and the carrier. Our research was focused on the phenomenon of yeast cell adhesion on ceramic type of solid carriers with different Zeta electrokinetic potential, also upon chemical modification and on the nature of particular yeast strains characterized by their hydrophobicity, surface charge, ability to flocculation and different surface electrokinetic properties seen at 4,5-5,0-5,5 pH values. The industrial brewery (top- and bottom-fermenting, flocculent and non-flocculent) and distillery yeast strains of *Saccharomyces cerevisiae* from stationary phase of growth were immobilized on ceramic supports in different conditions and the effectiveness of immobilization as well as fermentation performance were checked. The relationship between yeast cells and ceramics in the immobilization procedure was investigated using the Zeta potential measurement as an indicator. For selected type of Al ceramic carrier the effect of surface chemical modification via silylation on carrier surface electrokinetic potential and yeast cells adhesion in rich culture medium (wort broth) was tested. For the estimation of the number of adhered yeast cells and effectiveness of this process, microscopic observations of stained cells with methylene blue and DAPI fluorymetric method were applied. The results of conducted studies have shown that modification of Al-70 surface with silane Z-6020 (amine functional groups) led to significant change of Zeta potential values in different pH: from -24.6 mV to +9.0 mV (pH 4.5) and from -22.3 mV to +5.5 mV (pH 5.5). Also, yeast cell immobilization on this type of carrier was higher than in the case of modification done with epoxy group. It is suggested that the use of carriers with positive Zeta potential improved immobilization of cells with a negative Zeta potential and vice versa. Results of this experiment convinced us to modify the surface of another ceramics materials with high porosity made from fireclays (SNK, MAM, DL, MS) by covering it with a poly-cation such as poly-L-lysine (Mw 80-100 kDa) in order to enhance effectiveness of immobilization of negatively charged yeast cells. The number of cells adhered on these ceramic carriers after modification increased about 2÷5 times. However, the best results were noticed in the case of modified SNK carrier and KKP 192 bottom-fermenting yeast strain, where above 8 times increase of adhesion was seen after 4 hour and almost 14 times after 24 hours in comparison to non-modified carrier. Strong interactions between the polyanionic yeast cell surfaces and the polycationic layer of adsorbed poly-L-lysine can be explanation of such high attachment of yeast cells.

4 Czyzowska A, Laskowska J, Ambroziak W Influence of yeast on fruit-wine colour. The colour of young red wine is largely determined by the phenolic composition, particularly the red coloured monomeric anthocyanins, which are extracted from the grapes.

Yeast have different capacities to retain or adsorb phenolic compounds. Some yeast strain express â-glucosidase activities promoting anthocyanin degradation. On the other hand, yeast can contribute to the stabilization of wine colour, as a result of participation in the formation of vitisins during fermentation. The objective of this research was to examine the influence of yeast with â-glucosidase activity used for winemaking on the colour of sour cherry wine. Three *S.cerevisiae* yeast strains: Brusznica 7 (WK3), Madeira (W46), Pisport (£33), selected on the basis of previous trials, were used to produce the wines with replicated batches. Fermentation kinetics of the yeast strains were obtained by measuring weight loss because of the evolution

of CO_2 by the system. Colour density was calculated as the sum of absorbance at 620, 520 and 420 nm. And wine colour tint (hue)(T) as the ratio of absorbance at 420 to 520 nm. Monomeric anthocyanins were analyzed by HPLC. There are intrinsic differences between some yeast strain. All beginning fermentation vigorously but Pisport reached the maximum level of biomass and shortest logphase, prolonged logphase was observed in Madeira. Brusznica 7 completed the process after 14 days, Pisport after 25 days. The maximum content of monomeric anthocyanins was found when Madeira strain was used. Wine fermented with Pisport strain showed the highest colour density. Significant differences of colour intensity and anthocyanin concentration were found. These results showed that yeast may affect the wine chromatic profile and may be used as an important tool during winemaking for obtaining highly coloured wines.

This research is financially supported by the grant of the Polish Commission KBN 2 P06T 013 26.

5 Czyzowska A - Preliminary search for β-glucosidase activity of wine yeast.

The aim of this study was to evaluate β-glucosidase activity in a number of *S. cerevisiae* and non-*Saccharomyces* yeast strains involved in the vinification process. A total of 43 wine yeasts (from the £OCK culture collection at the Institute of Fermentation Technology and Microbiology of the Technical University of Lodz) were evaluated for their β-glucosidase activity. A screening method was carried out on agar plates with arbutin as a substrate. Inoculated plates were incubated at 25ºC without light and examined after 2,4,6 and 8 days. Strains with β-glucosidase activity hydrolyse the substrate and the dark brown colour develops in the agar around the yeast colony. Only six strains: four *S.cerevisiae* Brusznica 7 (WK3), Madeira (W46), Pisport (£-33) and Zeltinger (W48) and 2 non-*Saccharomyces*: Porzeczka 1 (WK1), Strasnitz £-40 showed this activity. All 6 strains displaying activity were fractionated to study the location activity and four fractions were obtained (supernatant, whole cell, supernatant after lysis, lysates (pellet)) according to method of Rossi et al (1994). Enzymatic activity was evaluated by determining the amount of pNP liberated from pNPG within an hour. Enzyme activity was expressed against yeast dry weight. All of strains showed weak activity in supernatant and weak or no activity in supernatant after lysis. Whole cell results were the most favourable. To determine the effect of oxygen, yeast were grown in both strictly anaerobic and aerobic conditions. All of strains showed activity (produced enzyme) in both conditions. Although it is not easy to draw general conclusions regarding the portion of the cell involved in â-glucosidase activity, the present results suggest that extracellular activity is weak and intracellular activity much more marked. Activity was strain-dependent. The highest β-glucosidase activity showed Porzeczka 1 strain, Pisport the lowest.

This research is financially supported by the grant of the Polish Commission KBN 2 P06T 013 26.

6 Laskowska J, Czyzowska A - Antioxidant activity and anthocyanins changes in aronia wines fermented different wine yeast.

In the general, the fruit wine making process is the same as making from grapes. Recent researches indicate that free radicals are responsible for incidence of cardiovascular and cancer diseases. Consequently, the role of antioxidants has received renewed attention. Above all, the natural antioxidants contained in grape wine have been studied extensively. Apart from grapes several various of berries are used in Europe for production of wine. Fruit wines can be made from aronia (*Aronia melanocarpa* Elliot), which is the most valuable raw material for the production of fruit wine.The aim of present work was the evaluation of possible correlation between total anthocyanins content and antioxidant activity of pure aronia wines fermented with selected wine dry yeast. The four strains of wine yeast (*S.cerevisiae*) were used. There was not differences in speed of fermentation process In the final products there was not differences also in total antioxidant activity, total polyphenolic compounds and anthocyanins. Average level of total polyphenolic compounds was 2000 mg/L and anthocyanins 500 mg/L. Total antioxidant activity expressed as TEAC ranged between (7.0-7.5 mM).

7 Laskowska J, Czyzowska A Correlation between polyphenolic compounds and antioxidant activity of cherry and black currant wines fermented with selected wine yeast.

Antioxidant activity of red grape wine is well documented. Antioxidants from grape wine protect against cardiovascular and cancer diseases. Antoxidant activity is very often used as a tool of evaluation of bioactivity of wines. The aim of research was the evaluation of possible correlation between polyphenolic compounds and antioxidant activity of cherry and black currant fruit wines fermented with selected wine yeast. The main aim of present work was evaluation whether there is correlation between polyphenolic compounds and antioxidant activity of cherry and black currant fruit wines fermented with selected wine yeast. Results indicated that there is correlation between total polyphenolic compounds and antioxidant activity expressed as TEAC and due to inhibition in oxidation of linoleic acid. Both cherry and currant wines were active in scavenging of free radicals and inhibiting of oxidation of linoleic acid. Among the cherry and black currant wines the best antioxidant activity was determined for wine fermented with *Saccharomyces cerevisiae* (Zeltinger) and *Saccharomyces cerevisiae* (Pisport) respectively. As results shows only in case of *S.c.* Pisport there was correlation between level of total polyphenolic compounds and total antioxidant activity which was determined both DMPD, ABTS or DPPH method.

8 Kordialik-Bogacka E., Ambroziak W. Adjusting the number of yeast repitching in the brewery.

In brewing, yeast is reused many times. A number of yeast repitching differs significantly among the breweries. In some breweries a lager brewing yeast culture is used 2-3 times while in others even 7-9 times for fermentation of wort at similar original gravity. In this study the impact of serial repitching on the yeast physiological condition and beer flavour was checked. The physiological conditions of two bottom-fermenting yeast strains *Saccharomyces cerevisiae* designated 308 and B4 (LOCK 0100 and 0075) post-propagation and upon completion of successive fermentations of hopped wort at original gravity of 10 ºPlato and 15 ºPlato were studied. The yeast physiological state was assessed by measuring the glycogen and trehalose content using enzyme assays. Simultaneously after successive fermentations beer flavour was evaluated by headspace-gas chromatography. Higher alcohol and ester contents were determined. Each fermentation was conducted in three replicates. For each strain ten successive fermentations were carried out with 10ºP wort and eight and seven ones respectively for 308 and B4 strain with 15 ºP wort. The intracellular glycogen and trehalose contents were a function of the yeast generation number and wort gravity. It was observed that for wort at 10 ºP the glycogen content remained consistently high during the first nine successive fermentations with both strains. In the case of 15 ºP wort the glycogen contents decreased after five fermentations for 308 strain and after six for B4 strain. In turn the evaluation of propagation and sequential harvested samples for the trehalose content showed its increase after nine fermentations for 308 strain and after five for B4 strain (10 ºP wort). In the case of 15 ºP wort trehalose levels in cropped slurries after seven fermentations for 308 strain and after six for B4 strain were higher than in the previous samples. These results demonstrate there was not a change in the physiological state and thus yeast quality until generation 5. It was also observed that flavour profiles of beers obtained after five successive fermentations were similar. No significant differences were observed for acetaldehyde, n-propanol, ethyl acetate, ethyl butyrate, ethyl caproate contents in all sequential beers over the course of serial repitching. But the decrease in isopentyl acetate, ethyl caprylate, 2-methyl-1-butanol and 3-methyl-1-butanol contents were seen in beers produced with yeast reused more than five times. Because the yeast physiological condition and consequently beer quality depend on many factors, such as the strain, wort gravity, yeast handling procedure, it is difficult to settle how many times to reuse yeast in the brewery. However, this study aimed to emphasize there is no reason for the extreme reduction of the number of yeast repitching, which happens in many breweries. We wanted to underline this issue, especially that only few works have been published regarding this subject.

The work was supported by 6FP Perceramics NMP3-CT-2003-504937.

9 Kordialik-Bogacka E, Izydorczyk M, Kuchciak T, Cedzynska K. Ambroziak W - Biosorption of cadmium by brewing yeast biomass.

The production of wastewaters contaminated with heavy metals is a serious environmental problem. Therefore the development of efficient and inexpensive treatments of these residual waters to remove heavy metals is of great importance. The application of biological processes allows to remove heavy metals from large volumes of dilute solutions more effectively than with the use of traditional treatments such as chemical precipitation or ion exchange. Both bacteria, yeast and fungi are able to accumulate and concentrate heavy metals from aqueous solutions but large quantities of biomass is necessary for biosorption process carried out at industrial scale. Therefore easy available and cheap waste yeast biomass from beer production can be a good biosorbent. The choice of optimal physicochemical conditions such as medium pH, medium temperature, yeast concentration, contact time is significant for the efficiency of detoxification in dilute effluents. In this work effects of these factors on the Cd^{2+}removal by waste brewing yeast was studied. Batch biosorption experiments were performed both in a stationary system and with shaking. The effect of pH on biosorption was investigated in the pH ranges of 2 – 8. Yeast in 1, 2, 5 and 10% was added to 500ml of solutions containing 10 – 100 ppm of metal ion. Biosorption tests were carried out at contact times amounting to 12, 24, 36 hours. The examined yeast had high binding capacity of cadmium. Our results confirmed that waste brewing yeast is a good adsorbent for cadmium ions from wastewater.

10 Leszczyñska J, Diowksz A, Lacka A, Bryszewska M, Wolska K, Ambroziak W - Role of bakery yeast and lactic acid bacteria in reduction of wheat flour immunoreactivity.

Due to an increasing amount of individuals with gluten intolerance and allergy to gluten proteins a number of actions are taken to obtain flour of decreased immunoreactivity, which could be applied in production of food with decreased allergenicity. Fermentation performed in the environment of sourdough by lactic acid bacteria and yeast is a natural stage in the traditional bakery technology of rye, mixed wheat-rye and also in some regions wheat bread production. During this process hydrolysis of carbohydrates and proteins occurs at the level dependent on individual features of microorganisms that are active in the whole fermentation process. In the presented study the effectiveness of yeast and lactic acid bacteria fermentation in reduction of wheat flour immunoreactivity was examined. Wheat flour of type 500 from the "Kruszynek" mill, which contained 18.8% of gluten, 0.51% of ash and 14.9% of water, was exposed to lactic acid and ethanol fermentation. Fermentation tests on wheat flour were conducted in sourdough prepared with a yield of 200. In the research monocultures of lactic acid bacteria (LAB) from *Lactobacillus* sp., yeast of *Saccharomyces cerevisiae* and mixed bacteria-yeast co-cultures were used. Fermentation was carried for 24 hours at 30°C. To evaluate immunoreactivity of gliadin fractions isolated from flours after fermentation the indirect ELISA technique was used, in which human sera containing antibodies against gliadins and monoclonal antibodies against

human immunoglobulin IgG were conjugated with alkaline phosphatase. The highest decrease of immunoreactivity of gliadin fraction was obtained after fermentation with monocultures of LAB strains: *Lb. plantarum* AD-98, *Lb. plantarum* LOCK0860 and *Lb. sanfranciscensis* DSM 20663. It was evidently related to a high multiplication of bacteria, which resulted in intensive acids production and protein hydrolysis (additional bands observed on the electrophoregrams). Fermentation conducted with yeast revealed decrease in immunoreactivity of gliadins as well, although to lesser extent. However the association of lactic acid bacteria and yeast significantly increases the degree of immunoreactivity reduction, which for mixed cultures, was the greatest in all tested samples. Obtained results allow drawing the conclusion that fermentation method of decreasing wheat flour allergenicity seems to be promising. What is more, fermentation is a natural process improving organoleptic and health properties of the final product. Modified in such a way wheat flour can be used as an additive to blends for people allergic to gluten as not all patients demonstrate the same sensitivity to this allergen, thus complete elimination of gluten from the product is not always necessary.

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XIX UMR1131 Vine health and Wine Quality, INRA, University Louis Pasteur - Strasbourg, France F-68000 Colmar - Enology team. Communicated by J. L. Legras.

Recent publications.

1 Legras JL, Merdinoglu D, Cornuet JM & Karst F 2007 Bread, Beer and Wine: *Saccharomyces cerevisiae* diversity reflects human history. Mol Ecol 16:2091-2102.

Fermented beverages and foods have played a significant role in most societies worldwide since millennia. To better understand how the yeast species *Saccharomyces cerevisiae*, the main fermenting agent, evolved along this historic and expansion process, we analyzed the genetic diversity among 651 strains from 56 different geographical origins, worldwide. Their genotyping at twelve microsatellite loci revealed 575 distinct genotypes organized in subgroups of yeast types, i.e. bread, beer, wine, sake. Some of these groups presented unexpected relatedness: Bread strains displayed a combination of alleles intermediate between beer and wine strains, and strains used for rice wine and sake were most closely related to beer and bread strains. However, up to 28% of genetic diversity between these technological groups was associated with geographical differences which suggests local domestications. Focusing on wine yeasts, a group of Lebanese strains were basal in a Fst tree, suggesting a Mesopotamia-based origin of most wine strains. In Europe, migration of wine strains occurred through the Danube Valley, and around the Mediterranean Sea. An Approximate Bayesian Computation approach suggested a post - glacial divergence (most probable period 10000 to 12 000 BP). As our results suggest intimate association between man and wine yeast across centuries, we hypothesize that yeast followed man and vine migrations as a commensal member of grapevine flora.

2 Oswald M, Fischer M, Dirninger N & Karst F 2007 Monoterpenoid biosynthesis in *Saccharomyces cerevisiae*. FEMS Yeast Research, 7:413-421.

Plant monoterpenoids belong to a large family of plant secondary metabolites with valuable applications in cosmetics and medicine. Their usual low levels and difficult purification justify the need for alternative fermentative processes for large-scale production. Geranyl diphosphate is the universal precursor of monoterpenoids. In yeast it occurs exclusively as an intermediate of farnesyl diphosphate synthesis. In the present study we investigated the potential use of *Saccharomyces cerevisiae* as an alternative engineering tool. The expression of geraniol synthase of *Ocimum basilicum* in yeast allowed a strong and specific excretion of geraniol to the growth medium, in contrast to mutants defective in farnesyl diphosphate synthase which excreted geraniol and linalool in similar amounts. A further increase of geraniol synthesis was obtained using yeast mutants defective in farnesyl diphosphate synthase. We also showed that geraniol synthase expression affects the general ergosterol pathway, but in a manner dependent on the genetic background of the strain.

3 Le Jeune C, Lollier M, Demuyter C, Erny C, Legras JL, Aigle M & Masneuf-Pomarède I 2007 Characterization of natural hybrids of *Saccharomyces cerevisiae* and *Saccharomyces bayanus* var. *uvarum*. FEMS Yeast Res 7:540-549.

Nine yeast strains were isolated from spontaneous fermentations in the Alsace area of France, during the 1997, 1998 and 1999 grape harvests. Strains were characterized by pulsed-field gel electrophoresis, PCR–restriction fragment length polymorphism (RFLP) of the *MET2* gene, ä-PCR, and microsatellite patterns. Karyotypes and *MET2* fragments of the nine strains corresponded to mixed chromosomal bands and restriction patterns for both *Saccharomyces cerevisiae* and *Saccharomyces bayanus* var. *uvarum*. They also responded positively to amplification with microsatellite primers specific to both species and were demonstrated to be diploid. However, meiosis led to absolute nonviability of their spores on complete medium. All the results demonstrated that the nine yeast strains isolated were *S. cerevisiae* × *S. bayanus* var. *uvarum* diploid hybrids. Moreover, microsatellite DNA analysis identified strains isolated in the same cellar as potential parents belonging to *S. bayanus* var. *uvarum* and *S. cerevisiae*.

Oral presentation at Yeast Lipid Conference, May 10-12, Turin, Italy.

4 Oswald M, Fischer M, Meyer S, Riveill G, Claudel P & Karst F 2007 *Saccharomyces cerevisiae* as an engineering tool for terpenoid production.

Poster presented at ISSY 2007.

5 Charpentier C, Colin A, Alais A, Legras JL 2007 Jura "Vin jaune" Flor yeast: characterization and relationships with other flor yeast.

6 Legras JL, Erny C, Adolphe Y, Le Jeune C, Lollier M, Delobel P, Blondin B and Karst F 2007 Phenotypic analysis and transcriptome profiling of *Saccharomyces cerevisiae* response to medium chain fatty acids.

XX Departamento de Microbiologia, ICB, C.P. 486, Universidade Federal de Minas Gerais, Belo Horizonte, MG, 31270-901, Brazil. Communicated by C. A. Rosa <carlrosa@icb.ufmg.br>.

Recent publications.

1 Martins FS, Rodrigues AC, Tiago FC, Penna FJ, Rosa CA, Arantes RM, Nardi RM, Neves MJ, and Nicoli JR 2007 *Saccharomyces cerevisiae* strain 905 reduces the translocation of *Salmonella enterica* serotype Typhimurium and stimulates the immune system in gnotobiotic and conventional mice. J Med Microbiol 56:352-359.

Previous results in the laboratory of the authors showed that *Saccharomyces cerevisiae* strain 905, isolated during 'cachaca' production, was able to colonize and survive in the gastrointestinal tract of germ-free and conventional mice, and to protect these animals against oral challenge with *Salmonella enterica* serotype Typhimurium or *Clostridium difficile*. In the present work, the effects of *S. cerevisiae* 905 on the translocation of *Salm.* Typhimurium (mesenteric lymph nodes, Peyer's patches, spleen, liver) as well as on the immune system (number of Kupffer cells, immunoglobulin production, clearance of *Escherichia coli* B41) were evaluated in gnotobiotic and/or conventional mice. The treatment with the yeast reduced significantly the translocation of *Salm.* Typhimurium to liver in gnotobiotic animals and to all the organs tested in conventional mice. The number of Kupffer cells per 100 hepatocytes in liver was significantly higher ($P<0.05$) in yeast mono-associated mice (52.9+/-15.7) than in germ-free controls (38.1+/-9.0). Probably as a consequence, clearance of *E. coli* B41 from the bloodstream was more efficient in yeast mono-associated animals when compared to germ-free mice. Higher levels ($P<0.05$) of secretory IgA in intestinal content and of IgA and IgM in serum were observed in yeast mono-associated mice when compared to germ-free group. Concluding, the protection against pathogenic bacteria observed in a previous study was probably due to a modulation of both local and systemic immunity of mice treated with *S. cerevisiae* 905.

2 Araujo RAC, Gomes FCO, Moreira ESA, Cisalpino PS, and Rosa CA 2007 Monitoring *Saccharomyces cerevisiae* populations by mtDNA restriction analysis and other molecular typing methods during spontaneous fermentation for production of the artisanal *cachaça*. Braz J Microbiol 38:217-223.

An ecological study on *Saccharomyces cerevisiae* populations in spontaneous fermentation has been conducted in three vats of a *cachaça* distillery in Minas Gerais, Brazil. Ninety-seven yeast isolates were collected at the beginning, the middle and at the end of the production period, and were identified by standard methods. Differentiation between the indigenous *S. cerevisiae* strains isolated was performed by mitochondrial DNA (mtDNA) restriction analysis, RAPD-PCR, and PCR fingerprint using an intron splice primer. Analysis of the mtDNA restriction profiles revealed 12 different patterns, 11 corresponding to indigenous yeasts (I to XI) and one (XII) to a commercial strain of the bakery yeast. Pattern II (53.6% of the population) and pattern IV strains were present in all the vats. Pattern IV strain raised from the middle to the end of the period reaching proportions near those of pattern II strain. PCR methods allowed the differentiation of 41 molecular profiles. Both methods showed population fluctuation of *S. cerevisiae* strains along the period of *cachaça* production and among different vats of the distillery.

3 Rosa CA, Morais PB, Lachance MA, Pimenta RS, Santos RO, Trindade RC, Figueroa DL, Resende MA, and Bragança MAL 2006 *Candida azymoides* sp. n., a yeast species isolated from tropical fruit and the larva of the fly *Anastrepha mucronota* (Diptera: Tephritidae). Lundiana – Int J Biodivers (in press).

Four strains of the new species *Candida azymoides* were isolated from larvae of *Anastrepha mucronota* (Diptera: Tephritidae) collected from ripe fruits of *Peritassa campestris* ("Bacupari", Hippocrateaceae) in Tocantins state and from ripe fruit of *Eugenia uniflora* ("pitanga", Myrtaceae) in Sergipe state, Brazil. *C. azymoides* is a sister species to *C. azyma* in the *Wickerhamiella* clade, in the Saccharomycetes. The type strain is *Candida azymoides* UFMG-R287 (CBS 10508).

4 Borelli BM, Ferreira EG, Lacerda ICA, Franco GR, and Rosa CA 2006 Yeast populations associated with the artisanal cheese produced in the region of Serra da Canastra, Brazil. World J Microbiol Biotechnol 22:1115–1119.

The aim of this work was to describe the yeast populations present during the manufacturing of Minas cheese of the region of Serra da Canastra, Minas Gerais state, Brazil. Canastra cheese is produced from raw cow's milk at the farmhouse level using artisanal procedures and natural whey cultures as starters. Samples from 10 farms were studied, and they included: raw milk, natural starter, cheese curd before salting and cheese after 5 days of ripening. The most frequent yeasts in whey, curd and cheese were *Debaryomyces hansenii, Kluyveromyces lactis, Kodamaea ohmeri* and *Torulaspora delbrueckii*. Many yeast isolates were able to produce proteases, lipases and β-galactosidades. Production of these enzymes by yeasts in the cheese would contribute to the development of the characteristic flavor and smell during the ripening process.

5 Goncalves JF, Franca JS, Medeiros AO, Rosa CA, and Callisto M 2006 Leaf breakdown in a tropical stream. Int Rev Hydrobiol 91:164-177.

The objectives of this study were to investigate leaf breakdown in two reaches of different magnitudes, one of a 3rd (closed riparian vegetation) order and the other of a 4th (open riparian vegetation) order, in a tropical stream and to assess the colonization of invertebrates and microorganisms during the processing of detritus. We observed that the detritus in a reach of 4th order decomposed 2.4 times faster than the detritus in a reach of 3rd order, in which, we observed that nitrate concentration and water velocity were greater. This study showed that the chemical composition of detritus does not appear to be important in evaluating leaf breakdown. However, it was shown to be important to biological colonization. The invertebrate community appeared not to have been structured by the decomposition process, but instead by the degradative ecological succession process. With regards to biological colonization, we observed that the density of bacteria in the initial stages was more important while fungi appeared more in the intermediate and final stages.

XXI CREM – Centro de Recursos Microbiológicos, Secção Autónoma de Biotecnologia, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, 2829-516 Caparica, Portugal. Communicated by J. P. Sampaio <jss@fct.unl.pt>.

The following papers have been recently published or are in press.

1 Libkind D, Ruffini A, van Broock M, Alves L and Sampaio JP 2006 Biogeography, host-specificity and molecular phylogeny of the basidiomycetous yeast *Phaffia rhodozyma* and its sexual state *Xanthophyllomyces dendrorhous*. Appl Environ Microbiol 73:1120-1125.

2 Aime C, Matheny PB, Henk DA, Frieders EM, Nilsson H, Piepenbring M, McLaughlin DJ, Szabo LJ, Begerow D, Sampaio JP, Bauer R, Weiss M, Oberwinkler F and Hibbett D 2006 An overview of the higher-level classification of Pucciniomycotina based on combined analyses of nuclear large and small subunit rDNA sequences. Mycologia 98:896-905.

3 Sampaio A, Sampaio JP and Leão C 2007 Dynamics of yeast populations recovered from decaying leaves in a nonpolluted stream: a 2-year study on the effects of leaf litter type and decomposition time. FEMS Yeast Research 7: 595-603.

4 Hibbett D *et al*. (47 other authors) 2007 A higher-level phylogenetic classification of the *Fungi*. Mycological Research (in press).

5 Margesin R, Fonteyne PA, Schinner F and Sampaio JP 2007 Novel psychrophilic basidiomycetous yeast species from alpine environments: *Rhodotorula psychrophila* sp. nov., *Rhodotorula psychrophenolica* sp. nov., and *Rhodotorula glacialis* sp. nov. Int J Syst Evol Microbiol (in press).

XXII Département Bioprocédés et Systèmes Microbiens, UMR-CNRS 5503. 5, rue Paulin Talabot. 31106. Toulouse cedex. France. Communicated by P. Strehaiano.

The last main results of our studies on yeasts are reported in three PhD dissertations.

1 Thesis of Dalal Jawich, dealing with the effects of pesticides on yeast activity. This work was done in relationship with the "Université Saint Joseph" of Beyrouth. (Lebanon).

The sensitivity of yeasts *Saccharomyces cerevisiae* and *Metschnikowia pulcherrima* to several pesticides was evaluated. Penconazole was further examined for its cytotoxicity and genotoxicity depending on cultural conditions and metabolic phase of growth. Penconazole inhibits growth and fermentation kinetics of both yeasts at low residual concentrations (0.2-2 ppm) when added at the beginning of growth cycle, *M. pulcherrima* being more sensitive; DNA adducts were detected in cultures contaminated during their exponential growth. These findings were validated by testing our yeast experimental system towards benzo(a)pyrene and aflatoxin B1 (0.2 and 2 ppm), two reference genotoxic compounds. DNA adducts were obtained in all cultures exposed to benzo(a)pyrene, and aflatoxin B1 induced DNA adducts only when added during exponential phase; whereas growth was not altered by any of the two.

2 Thesis of Vincent Renouf, dealing with the behaviour of the microbial population in winemaking. This work was done in relationship with the "Faculté d'Oenologie de Bordeaux" (France).

On the grape, a large variety of micro-organisms coexist in an organized system including the principal species useful for winemaking. After pressing, interactions between yeasts and bacteria ensure alcoholic fermentation and fermentations. After sulphiting, the evolution of residual species suggests that interactions persist during the period of ageing, which can lead to a wine spoilage if species as the yeast *Brettanomyces bruxellensis* persist. The understanding of these evolutions is necessary and needs a global view of the microbial diversity. Each technological operation and fermentative process influences the species and strains diversity. The system is gradually simplified because the wine becomes more and more deprived and toxic. Among the most resistant species, there are *O. oeni* and *B. bruxellensis*. Strains collections have been constituted for these species. The instraspecific diversity is shown by phenotypic and genetics studies in the first one. The variability in volatile phenols production, which spoils wine, is shown in the second.

2. Thesis of Pascal Barbin, dealing with the behaviour of *Brettanomyces* in a cellar. This work was done in relationship with the cellar "les Vignerons de Buzet" and Oenodev S.A. (France).

Yeast *Dekkera*/*Brettanomyces* is a contaminant responsible for red wine spoilage implying the development of animal and phenolic off-odours. A complete procedure, using a combination of simple discriminating criteria, has been developed to detect and isolate the contaminant. Results proved the presence of the contaminant from various winemaking environments from grape berries to bottled wines. We also showed that environmental factors, such as humidity, play an important role on the presence of the contaminant on berries surface. Moreover, a huge diversity was described among the *Brettanomyces bruxellensis* species : from genetical level to physicological and phenotypical aspects. Growth profiles, susbtrates consumption, volatiles phenol and acetic acid productions varied significantly from one isolated strain to another. Our studies revealed that the use of complement during the winemaking process also has an influence on the contaminant development. Thiamin (at 0,6 mg/L), nitrogen (from $(NH_4)_2SO_4$) and tannins powder modified both growth and volatile phenols in different ways and levels.

XXIII Department of Biology, University of Western Ontario, London, Ontario, Canada N6A 5B7. Communicated by M.A. Lachance <lachance@uwo.ca>.

The following papers have now appeared in print.

1 Rosa CA, Lachance MA, Teixeira LCRS, Pimenta RS & Morais PB 2007 *Metschnikowia cerradonensis* sp. nov., a yeast species isolated from ephemeral flowers and their nitidulid beetles in Brazil. Int J Syst Evol Microbiol 57:161-165.

2 Manson JS, Lachance MA, Thomson JD 2007 *Candida gelsemii* sp. nov., a yeast of the Metschnikowiaceae clade isolated from nectar of the poisonous Carolina jessamine. Antonie van Leeuwenhoek 92:37-42.

3 Suh SO, Blackwell M, Kurtzman CP, Lachance MA 2006 Phylogenetics of Saccharomycetales, the ascomycete yeasts. Mycologia, 98:1006–1017.

Obituary

Doc. Ing. Erich Minárik, DrSc. (1924-2007)

We are sad to announce that a longtime representative of the Czechoslovak Commission on Yeasts and a member of the International Commission on Yeasts, Doc. Ing. Erich Minárik , DrSc. died on May 20, 2007, in Bratislava, Slovakia. He will be deeply missed not only by the families of his two sons, but also by the scientific community of the Czech Republic and Slovakia. He will be remembered as a leading wine-yeast researcher, outstanding teacher, enthusiastic organizer of national and international scientific meetings on yeast research and a frequent contributor to journals devoted to the microbiology of wine and winegrowing.

Born in the town of Sereï in Slovakia on September 17, 1924, he graduated from the Slovak Technical University in 1950. After graduation he joined the Research Institute for Viticulture and Enology in Bratislava, in which he remained till his late retirement. He was awarded his PhD degree in 1960 and habilitated at the Technical University in 1966. His main scientific contribution can be recognized in microbiology and technology of wine production. He published more than two hundred papers, several books and student textbooks. His most successful work is the book on winemaking published in three volumes, chemistry, microbiology and analysis, which was awarded the price of the Office Internationale de la Vigne et du Vin, in Paris in 1967 and 1971.

Professor Minárik was a co-founder of the Czechoslovak Commission on Yeasts in 1964 and of the International Commission on Yeasts of the International Union of Microbiological Societies 1966 together with the late Dr. Anna Kocková-Kratochvílová. For almost 25 years he was in charge of the Czechoslovak Commission on Yeasts, its annual conferences and international yeast symposia, first as secretary and later as chairman. Other international activities of Prof. Minárik included organization of wine contests. He worked as a secretary in seven such events held in Bratislava. For his scientific life achievements he received in 1998 the Slovak state price, Order of Ludovít Štúr.

In Professor Minárik we are losing not only an outstanding scientist, but also a generous, warm and good-natured man of a firm character, a real gentleman. He also will remain in our memories as an example of hard-working honest scientist, with remarkable self-discipline and organization of his time. His last work was an evaluation of a PhD thesis from microbiology finished just few hours before his sudden death.

Peter Biely

Recent meeting

35rd Annual Conference on Yeasts of the Czech and Slovak Commission on Yeasts Smolenice, Slovakia, May 16-18, 2007

The 35th Annual Conference on Yeasts, organized regularly by the Czech and Slovak Commission on Yeasts and the Institute of Chemistry, Slovak Academy of Sciences, took place in the Smolenice Castle, the Congress Center of the Slovak Academy of Sciences, during May 16-18, 2007. The Conference was supported by the Visegrad Fund, a fund to accelerate the cooperation between the four Central European countries, Czech Republic, Hungary, Poland and Slovakia. The fund enabled the organizers to invite several foremost foreign yeast researchers, such as Prof. J. R. Dickinson from the Cardiff School of Biosciences in UK, Prof. L. Breitenbach-Kollerová from the Salzburg University in Austria, Dr. V. Mrša from the Zagreb University in Chroatia, Dr. B. Willingerová from the Medical University in Vienna, Austria and Prof. M. Sipiczki from the Debrecen University in Hungary. The fund was also used to help a number of young scientists from the Visegrad countries to attend the conference. The large participation of foreign scientists, in addition to a large attendance from the Czech Republic, gave this time to the conference a really international character. The conference language became definitely English. Several invited speakers were supported by the organization NATURA associated with the Faculty of Natural Sciences of the Comenius University. Prof. J.R. Dickinson presented the opening memorial lecture of Dr. A. Kocková-Kratochvilová "Filament formation in *Saccharomyces cerevisiae*".

The program consisted of three sessions dedicated to Genetics and Molecular Biology of Yeasts, Biochemistry and Cell Biology of Yeasts and Biotechnology and Medical Mycology. 63 posters complemented 25 oral presentations. Interesting scientific program also included wine presentation and wine tasting by two Slovak wine-producing companies, Vinanca from the town Vrable and Villa Vino from the suburb of Bratislava, called Rača.

The conference opening included a small joyful celebration. The chairman of the Czechoslovak Society for Microbiology, Doc. Ing. Ivan Čižnár, DrSc., awarded the highest award of the Society, the František Patočka Medal to distinguished representatives of the Czech and Slovak microbiology Doc. Ing. Vladimír Farkaš, DrSc. from the Institute of Chemistry of the Slovak Academy of Sciences in Bratislava, and RNDr. Karel Sigler, DrSc. from the Institute of Microbiology of the Academy of Sciences of the Czech Republic in Prague, for outstanding scientific achievemnets and for a long-term organization work in the Societay for Microbiology.

The successful conference ended with a meeting of the Committee of the Czech and Slovak Yeast Commission, on which it was decided that the 36th Annual Yeast Conference will be organized in the Smolenice Castle in May 2008. Suggestions were presented for eventual organization of another International specialized symposium on yeasts sometimes around the year 2010. The last specialized yeast symposium was organized in Slovakia in 1999 on the theme "Cell Surfaces and Membrane Phenomena". The titles of lectures and posters of the 35th Annual yeast conference are listed below:

Lectures in the session Genetics and Molecular Biology of Yeasts

1 Papp B.: R7obustness revisited: The condition dependency of genetic interactions.
2 Szamecz B., Rutkai E, Nielsen KH, and Valášek L - Association of eukaryotic translation initiation factor 3 (eIF3) with the 40S ribosome post the termination step on short uORF is a critical determinant of its ability to reinitiate.
3 Płta F, Gahura O, Abrhámová K, Munzarová V, Valentová A, and Folk P - The study on essential spliceosomal protein Prp45 in *Saccharomyces cerevisiae.*
4 Gregáň J and Rumpf C - Pcs1 and Mde4 are required to prevent merotelic kinetochore orientation.
5 Letavayová L, Vlasáková D, Brozmanová J, and Chovanec M - Toxic and mutagenic effects of three different chemical forms of selenium.
6 Kissová I, Deffieu M, Salin B, Velours G, Manon S, and Camougrand N - Mitophagy: Selective autophagic degradation of mitochondria.

Lectures in the session Biochemistry and Cell Biology of Yeasts

7 Breitenbach-Koller H. et al - What a difference a ribosomal protein makes.
8 Drobcová B, Mentel M, Kiššová I, Kolarov J, and Polčic P - Reconstituting mammalian apoptotic switch in yeast.
9 Šimočková M. Holič R and Griač P - Pgc1p - phosphatidylglycerol specific phospolipase C.
10 Mrša V - Biotechnologist's view of the yeast cell wall.
11 Tahotná D, Holič R, Poloncová K, Šimočková M, and Griač P - Family of phosphatidylinositol transfer proteins in *Saccharomyces cerevisiae*: lipid transfer and beyond.

12 Kregiel D, Berlowska J, and Ambroziak W - Surface charge and hydrophobicity of yeast cells in different physiological states.
13 Opekarová M. Grossmann G, Malinsky J and Tanner W - Lateral compartmentation of proteins and lipids in the plasma membrane: involvement of the membrane potential.

Lectures in the session Biotechnology and medical mycology

14 Willinger, B - Trends in laboratory diagnosis of invasive fungal infections.
15 Schabereiter-Gurtner, C, Selitsch, B, Hirschl, A.M, Rotter, ML and Willinger, B - Novel real-time PCR tests for early diagnosis of infections with *Candida* and *Aspergillus*.
16 Raclavský, V, Trtková, J, Rusková, L, Postlerová, L and Hamal, P - Identification and typing of pathogenic yeasts based on melting curve analysis.
17 Borecká-Melkusová, S, Moran G.P, Kucharíková S, Chorvát D. Jr, Bujdáková H and Sullivan D - Differential resistance gene expression in *Candida albicans* and *Candida dubliniensis* biofilms exposed to fluconazole.
18 Sipiczki, M and Kajdacsi, E - Post-harvest bioprotection of fruits by yeasts with antimicrobial activities.
19 Hrdinová, J, Jirkł, V, Čejková, A and Masák, J - Biodegradation of cellulose by yeast.
20 Schreiberová, O, Masák, J, Čejková, A, Jirkł, V and Krulikovská, T - Interaction of heavy metals with *Saccharomyces cerevisiae*.
21 Mazur, M, Boťanská, P, Furdíková, K, Kaliňák, M, and Valko, M - 600 MHz NMR spectrometer – an excellent tool for wine analysis.
22 Zavoral D - BioTech – distributor of New Brunswick Scientific in Czech Republic and Slovakia.

Lectures in the session Yeast community resources

23 Vadkertiová R and Sláviková E - Culture Collection of Yeasts (CCY).
24 Tomaška Ľ. et al - Yeasts in the Classroom.

Posters session I: Genetics and Molecular Biology of Yeasts

25 Abelovská L, Tomaška Ľ - Mutations of the *Saccharomyces cerevisiae* gene YOL138c affect mitochondrial ion homeostasis and telomere length.
26 Džugasová V, Sidorová M, Hikkel I, Drobná E, Šubík J - Overexpressed loss-of-function pdr3 mutant alleles sensitize yeast cells to drugs by suppression of the PDR5 expression.
27 Farkas Z, Kucsera J, Vágvölgyi C, Pfeiffer I - Mitochondrial DNA polymorphism among *Candida albicans* clinical isolates in Hungary.
28 Fričová D - Analysis of the MGM101 homolog from the yeast Candida parapsilosis.
29 Balková K, Šarinová M, Gbelská Y - Isolation of the KlPDR1 gene encoding the transcriptional regulator of multidrug transporters from *Kluyveromyces lactis*.
30 Gunišová S, Nosek J, Tomáška Ľ. : Telomerase of *Candida* species is awaiting identification of its RNA subunit.
31 Holešová Z, Nosek J - Protein degradation pathway controls the dimorphism of the pathogenic yeast *Candida parapsilosis*.
32 Keszthelyi A, Farkas Z, Hamari Z, Pfeiffer I, Vágvölgyi C, Kucsera J - Comparison of killer toxin producing and toxin non-producing *Filobasidium capsuligenum* strains.
33 Višacká K, Kinský S, Petrovičová J, Nosek J, Tomáška Ľ - Biochemical and genetic analysis of HMG-box containing mitochondrial protein CamtHMG1 of the yeast *Candida albicans*.
34 Gunišová, S, Kramara, J, Nosek, J, Tomáška, Ľ - Toward elucidation of mechanism of generation and function(s) of two forms of Schizosaccharomyces pombe Taz1 protein.
35 Laco J, .Zeman I, Kolarov J - Examining the role of yeast Sal1 protein in mitochondrial metabolism.
36 Márová I, Duroňová K, Obruča S, Ondruška V, Mikulcová A, Kučerík J, David J, Vojtová L - Analysis of genotoxicity of biocomposite degradation products using *Saccharomyces cerevisiae* D7 test system.
37 Pasikowska M, Orłowski J, Palamarczyk G - Genetic and biochemical evidence that the ROT1 gene of *Saccharomyces cerevisiae* links dolichol-dependent protein glycosylation and the cell wall assembly.
38 Petrezsélyová S, Laláková J, Tomáška, Ľ - Analysis of yeast mutants selectively resistant to K+-ionophores acting on inner mitochondrial membrane.
39 Drobcová B, Mentel M, Kiššová I, Kolarov J, Polčic P - Reconstituting the mammalian apoptotic switch in yeast.
40 Poloncová K, Griač P - Sfh3p and Sfh4p: Different pathways, same role?
41 Rumpf C, Gregan J - Pcs1 and Mde4 are required to prevent merotelic kinetochore orientation.
42 Sollner S, Durchschlag M, Prem A, Deller S, Macheroux P - Lot6, a quinone reductase associated with the yeast 20S proteasome, plays an essential role in apoptosis.
43 Černická J, Kozovska Z, Hnatova M, Valachovič M, Hapala I, Riedl Z, Hajós Gy, Šubík J - Chemosensitization of *Saccharomyces cerevisiae* and clinical yeast isolates to antifungals.
44 Zimmermannova O, Papouskova K, Pribylova L, Sychrova H - Na+/H+ antiporters from osmotolerant yeast species increase the salt tolerance of Saccharomyces cerevisiae.
45 Tichá E, Polakovičová V, Obernauerová M - Identification of factors that regulate the expression of PGS1 gene in aerobic yeast *Kluyveromyces lactis*.
46 Valach M, Pfeiffer I, Nosek J - Mitochondrial DNA of the yeasts *Candida sojae* and *C. viswanathii*: Genome organization and comparative analysis.
47 Vlčková V, Naļová S, Kopásková M, Gasperová P, Alföldiová Ľ, Komjatiová M, Ševčovičová A, Miadoková E, Vlček D - Genotoxic/antigenotoxic activity of hypericin in yeast, bacteria and algae.
48 Vránová D, Vadkertiová R, Sláviková E - Comparison of the yeast strains of the *Saccharomyces* genus isolated from the various environments.

Posters session II: Cell Biology and Biochemistry and Biotechnology, and Medical Mycology

49 Berlowska J, Kregiel D, Ambroziak W - Adhesion of selected yeast strains and stability of cell-carrier system during alcohol fermentation.
50 Czabany T, Wagner A, Zweytick D, Ingolic E, Spanova M, Hapala I and Daum G - Lipid particle variants from *Saccharomyces cerevisiae*.

51 Ehammer H, Rauch G, Kappes B, Macheroux P - NADPH utilization of chorismate synthase and its implications for the evolution of the shikimate pathway.
52 Kaliszewski P, Szkopińska A, Berges T, Zoladek T - Rsp5 is involved in co-regulation of unsaturated fatty acid and ergosterol synthesis in yeast.
53 Kohút P, Valachovič M, Hronská L and Hapala I - Dehydroergosterol as a tool for studying *S. cerevisiae* sterol uptake and distribution.
54 Mészárosová Cs, Dudíková J, Kolarova N - Glycosidases profiles of capsular and acapsular form of the yeast *Cryptococcus laurentii*.
55 Leszczyńska J, Diowksz A, Łącka A, Bryszewska M, Wolska K, Ambroziak W - Role of bakery yeast and lactic acid bacteria in reduction of wheat flour immunoreactivity.
56 Okrajni J, Zboromirska-Wnukiewicz B, Kozioł G, Ambroziak W - Electrokinetic potential of yeast cell and solid carrier surfaces and yeast immobilization.
57 Mazáň M, Farkaš V and Mazáňová K - Binding of alkali-sensitive protein Pir4/Ccw5 to cell wall and its importance for wall stability in model yeast *Saccharomyces cerevisiae*.
58 Omelková J, Matalová S, Trachtová Š, Sláviková E, Šimkovic I - Study of the production of hydrolytic enzymes on wheat straw by yeasts and yeasts like fungi.
59 Pichova A, Sigler K - The daughters of *Saccharomyces cerevisiae* RAS2val19 mutant are born old.
60 Ryabova O, Vršanská M, Biely P - Xylan-degrading enzymes of *Pichia stipitis*.
61 Drietomská A, Kodedová M, Hendrych T, Sigler K, Gášková D - Testing the effect of lysosomotropic compounds on *Saccharomyces cerevisiae*.
62 Petényi N, Keszthelyi A, Kucsera J, Vágvölgyi C, Golubev W.I, Pfeiffer I - Killer toxin of *Pichia anomala* VKM Y-159.
63 Brezová V, Staško A, Zalibera M, Brindzová L, Gescheidt G, Čertík M - Application of EPR spectroscopy in analysis of wine from Slovak and Burgenland region.
64 Čertík M, Furdíková K, Rapta P, Mazúr M, Brezová V, Brindzová L, Dudinská D, Kučera A,Vajcziková, I - Characterization of physico-chemical properties of Slovak Frankovka wines.
65 Čertík, M, Rapta, P, Breierová, E, Zalibera, M, Hanusová, V - Effect of two-step DMSO isolation on profile and properties of extracts from pigment-forming yeasts stressed by heavy metals.
66 Čertík M, Furdíková K, Rapta P, Mazúr M, Brezová V, Dudinská D, Tomanová, S - Characterization of physico-chemical properties of Slovak red wines produced by Vinanza.
67 Rapta P, Zalibera M, Čertík M, Breierová E - Influence of Zn2+, Ni2+ and Cu2+ ions in determination of radical scavenging capacity of yeast extracts by EPR spectroscopy.
68 Halienová A, Márová I. , Čarnecká M. , Konečná H, Hezinová V, Hanusová V, Čertík M - Proteome analysis in *Rhodotorula glutinis* cells grown under external stress conditions.
69 Čarnecká M., Hanusová V, Čertík M, Hezinová V, Halienová A, Breierová E, Márová I - Preparation of protoplasts from several carotenogenic yeasts: a comparative study.
70 Czyæowska A - Preliminary search for ß-glucosidase activity of wine yeast.
71 Czyæowska A, Laskowska J, Ambroziak W - Influence of yeast on fruit-wine colour.
72 Ekert M, Fujs Š, Ščančar J, Raspor P - Cross-protection responses against Cr(III) and Fe(III) ions in *Saccharomyces cerevisiae*.
73 Kordialik-Bogacka E, Ambroziak W - Adjusting the number of yeast repitching in the brewery.
74 Kordialik-Bogacka E, Izydorczyk M, Kuchciak T, Cedzyńska K, Ambroziak W - Biosorption of cadmium by brewing yeast biomass.
75 Laskowska J, Czyæowska A - Antioxidant activity and anthocyanins changes in aronia wines fermented different wine yeast.
76 Libjaková L, Paulovičová E, Bystrickż S, Karelin A. A. , TsvetkovYu. E. , Nifantiev N. E - The role of oligosaccharides in serologic response.
77 Márová I, Ondruška V, Obruča S, Trčková M, Vojtová L, David J - Biodegradation of modified biocomposites by *Aureobasidium pullulans*.
78 Mazur M, Boťanská P, Furdíková K, Kaliňák M, and Valko M - Minor compounds in wine seen by high field NMR spectroscopy.
79 Paulovičová E, Hudáková T, Kertys P, Hrubiško M - Diagnostic relevance of cell wall polysaccharides.
80 Sláviková E, Košíková B, Sasinková V - Biodegradability of extractives in sound and biologically decayed beech by various yeast strains.
81 Sláviková L, Omelková J, Breierová E - The influence of the mode of preservation on the physiological properties of *Sporobolomyces salminocolor*.
82 Tomšíková A - Vaccination in the therapy and prevention against mycotic infection.
83 Vajcziková I, Breierová E, Vadkertiová R - Killer activity of non-*Saccharomyces* yeasts associated with grape must and wine.
84 Vajcziková I, Pátková J, Breierová E - Yeast and wine flavour.
85 Letavayová L, Vlasáková D, Vigašová D, Krascsenitzová E, Mániková D, Vlčková V, Chovanec M, Brozmanová J - Cellular response to DNA damage induced by sodium selenite in *Saccharomyces cerevisiae*.
86 Laskowska J, Czyæowska A - Correlation between polyphenolic compounds and antioxidant activity of cherry and black currant wines fermented with selected wine yeast.
87 Zupan J, Raspor P - A new method for quantification of yeast invasion.

Communicated by Peter Biely

Forthcoming Meetings

Yeast 2007

Melbourne Exhibition and Convention Centre - July 1-6, 2007

www.yeast2007.org

Yet another of the world's best genetics conferences is coming to Australia! This time it will be the 23rd International Conference on Yeast Genetics and Molecular Biology (ICYGMB). I would argue that yeast is the best model for genetics research and it is certainly a well known contributor to molecular biology. Even the latest Nobel Prize in Chemistry goes to Roger Kornberg is for discoveries made in yeast.

This meeting is held every second year and it will be the first time it has been held in Australia. It is expected to attract around 1000 yeast researchers from around the globe and is eagerly anticipated by our local researchers, known as The Australian Yeast Group [www.australianyeastgroup.org]. The program for the meeting is well advanced and will include Keynote speakers Gerry Fink and Sir Paul Nurse as well as 30 symposia speakers.

Conference themes include:

Yeasts in brewing, wine and biotechnology
Protein transport and turnover
Membrane proteins and lipids
Other yeast and fungi as model systems
Cytoskeleton
Yeasts as pathogens: biology and clinical concerns
Post-translational modifications and proteomics
Transcription and control of gene expression
Chromosomes - structure and inheritance
Organelle division and inheritance
Cell signalling
Yeast models for human disease and ageing
Bioinformatics and genome-wide studies
Nuclear structure/ organization

There will be considerable public engagement with the final day devoted to sessions on the contributions of yeast to our lives in the 21st century. Topics will include:

The supply of insulin produced in yeast to diabetics
Prevention of liver cancer and hepatitis by yeast-derived vaccines
New vaccine for cervical cancer
The role of yeast in cancer research
Yeast in neurodegenerative disease research
Yeast in the screening of new drugs
Yeast in the development of a malaria vaccine
New therapeutic antibodies for cancers from yeast
Yeast and contributions to the energy crisis

Please keep informed up updates on our website and register your interest to attend. We look forward to seeing you there.

Ian Macreadie (Conference Chair, on behalf on The Australian Yeast Group)

Communicated by Wieland Meyer

Biology of *Kluyveromyces* (XX)

University of Paris, South Campus, Orsay, September 7-9, 2007

Dear Colleagues,

The annual meeting "Biology of *Kluyveromyces* (XX)" will be held at the University of Paris South Campus, Orsay, on September 7-9 2007 (Friday evening to Sunday noon). The deadline for registration is June 1 2007. Contributors are requested to send (or e-mail) a one-page abstract before August 1 2007. For practical details, another mail will be circulated in April. Contact:

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9th European Conference on Fungal Genetics (ECFG9)
Edinburgh, 5-8 April 2008

On behalf of the Organising Committee, we invite you to Edinburgh to join us and participate in ECFG9. ECFG has been held every two years in a different European city since the inaugural meeting in Nottingham in 1992. It now returns to the UK and will be held in Scotland's historic capital city.

The first announcement can be found at
http://www.ecfg.info/

and we hope you will take the opportunity to register your interest in attending the conference. Please also revisit the web-site as it develops to include information on the scientific programme, registration, accommodation, social programmes and links to satellite meetings.

We look forward to seeing you in Edinburgh.

David Archer

Chair of the Organising Committee, ECFG9

John Peberdy

12th International Congress on Yeasts, Kyiv, Ukraine, August 11-15, 2008

I am pleased to inform that, according to the decision of the International Commission on Yeasts, adopted at 11th International Congress on Yeasts (Rio-de-Janeiro, Brazil, August 2004), the 12th International Congress on Yeasts will be held in 2008 in Kyiv (Kiev), the capital of Ukraine. At the moment, the Local Organizing Committee, the Secretariat and the International Scientific Committee have been established. The Congress venues will be the Kyiv National Convention Centre and the Kyiv National University. The dates of the Congress are fixed for August 11-15, just after finishing the IUMS 2008, Istanbul, Turkey, i.e. after 12th International Congress of Bacteriology and Applied Microbiology and 12th International Congress of Mycology. In such a way, people attending IUMS in Istanbul could participate also in our Congress in Kyiv, which is especially convenient for people outside of Europe. Total number of participants will be limited to 500. The regular registration fee will be EUR 400 and the student registration fee will be EUR 350. The fee will include the bag with abstract and program, get-together party, 4 lunches, coffee breaks, Kyiv city tour and the opening concert. Organizers plan to collect sponsor money which will be used in part to promote participation of the students from developing countries.

Recently, the organizers have posted the web page of the Congress (see: www.icy2008.org.ua). Besides, the preliminary scientific program of the Congress is available. The list of the oral and poster sessions is as follows:

1. Yeast Systematics and Ecology
2. Food and Beverage Yeasts
3. Medically Important Yeasts
4. New Tools in Yeast Research
5. Systems Biology
6. Genomics and Proteomics
7. Transcriptional and Translational Regulation
8. Cell Cycle
9. Sensing and Signaling
10. Membrane Structure and Functions
11. Traffic and Secretion
12. Autophagy and Stress Response
13. Organelles
14. Yeast as Model of Human Diseases and Drug Testing
15. Production of Heterologous Proteins
16. Metabolic Engineering
17. Yeasts for Fuel Ethanol Production and other Biorefineries
18. Yeast Biochemical Engineering

All correspondence and inquiries should be sent to:

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or to:

Dr. Andriy Y. Voronovsky (same address)

Phone: 380 322 740363
FAX: 380 322 721648.

The most convenient is to send inquiries to the special e-mail address
<icy2008@cellbiol.lviv.ua>

Glutathione and related thiols in microorganisms
Nancy, France, August 27-29 2008

A symposium concerning the multiple facets of Glutathione and related thiols in microorganisms will be held in Nancy (France) in August 2008 (27-29). The research effort on microbial thiols, in particular (but not only) glutathione, increased in the last ten years, in part because thiols were identified as important components of cell defence against oxidative, metals, xenobiotics, nutritional, osmotic, acid, etc. stresses, but also because these derivatives are now recognized as involved in signal transduction mechanisms. Thiols were also identified as playing major roles in cell cycle, from differentiation to apoptosis, and cell organisation as exemplified by aggregation, biofilm formation and also in interaction between microorganisms and plants. Moreover, glutathione is of interest for applications in food, pharmaceutical, cosmetic industry and environmental technology, especially waste water treatment. Different investigation fields will be thus covered in the planned symposium. We think that so it will be a nice opportunity to create a platform for exchanging ideas, and assembling investigators coming from different horizons. The three day meeting will include invited plenary lectures, oral communications and poster sessions. Arrangement will be taken with a scientific editor to publish communications in an international peer-reviewed journal.

In the last ten years, research effort on microbial thiols, in particular (but not only) glutathione, increased strongly. This was because thiols were identified as important components of cell defence against oxidative, metals, xenobiotics, nutritional, osmotic, acid, etc... stresses, but also considering that these derivatives are now recognized as involved in signal transduction mechanisms. Thiols were also identified as playing major roles in cell cycle, from differentiation to apoptosis, and cell organisation as exemplified by aggregation, biofilm formation and also in interaction between microorganisms and plants. Microorganisms, in particular yeast, are also considered as useful eukaryotic cell models, for example in studies on the oxidative stress and signal transduction mechanisms. Moreover, glutathione is of interest for applications in food, pharmaceutical, cosmetic industry and environmental technology, especially waste water treatment. Different investigation fields will be thus covered in the planned symposium. We think that so it will be a nice opportunity to create a platform for exchanging ideas, and assembling investigators coming from different horizons.

The organizing and scientific committee has already planned a programme in order to cover all the considered items. Full informations concerning the symposium and registration, abstract submission are available on the following web site: http://www.thiolmicrob.uhp-nancy.fr.

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Brief News Items

Change of Address: Dr. Andrew Gould

Please note my new address:

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Retirement: Dr. W. M. (Mike) Ingledew

On July 31, 2007 I will retire from the University of Saskatchewan after 37 years of service. I will continue my half time position with Ethanol Technology Institute where, as Scientific Director, I organize the two week long Alcohol Schools in Toulouse (June) and Montreal (September) and edit The Alcohol Textbook - the fifth edition of which we hope will be published in mid 2008. I can still be contacted via my University email address: <mike.ingledew@usask.ca>.