Y E A S T

A Newsletter for Persons Interested in Yeast

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Herman J. Phaff, Editor
University of California, Davis, California 95616

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Herman J. Phaff
Editor

I. American Type Culture Collection, 12301 Parklawn Drive, Rockville, Maryland 20852-1776. Communicated by S.C. Jong.

The strains listed below have been added to the ATCC since October 28, 1982. Complete information for these strains may be obtained upon request from the Mycology Department of ATCC.

Saccharomyces cerevisiae ATCC 48105-48107	H. Fukuhara Institut Curie France
Saccharomyces cerevisiae ATCC 48118-48120	F. Ramos Univ. Libre de Bruxelles Belgium
Saccharomyces cerevisiae ATCC 48121-48125	F. Messenguy C.E.R.I.A. Belgium
Candida albicans ATCC 48130	T. Arai Chiba University Japan
Saccharomyces cerevisiae ATCC 48137	B. Schultz Hudepodl Brewing Co. Cincinnati, Ohio
Candida tropicalis ATCC 48138	B.J. Wiley U.S. Army Natick Natick, MA
Saccharomyces cerevisiae ATCC 48161	M.J. Leibowitz WMDNJ-Rutgers Medical School Piscataway, New Jersey
Candida boidinii ATCC 48180	T. Egli Swiss Federal Institute for Water Switzerland
Saccharomyces cerevisiae ATCC 48181	H. Fukuhara Centro University France
Cryptococcus neoformans ATCC 48182	R. Ikeda Meiji College of Pharmacy Japan
Filobasidiella neoformans ATCC 48183-48185	"
Pityrosporum sp. ATCC 48201	A.D. Oberle LSU Medical Center Shreveport, LA

Saccharomyces cerevisiae ATCC 48227	A. Nasim National Research Council Canada
Saccharomyces cerevisiae ATCC 48228-48229	R.Y.C. Lo University of Guelph Canada
Saccharomyces rouxii ATCC 48230-48233	S. Windisch Institut fur Mikrobiologie Germany
Saccharomyces cerevisiae ATCC 48246-48248	J. Oliver Lampen Rutgers University Piscataway, New Jersey
Rhodotorula glutinis ATCC 48249	B. Kirsop NCYC England
Saccharomyces cerevisiae ATCC 48250-48253	"
Candida albicans ATCC 48270	G. Oliver Univ. de Microbiologica Argentina
Candida albicans ATCC 48274, 48501 48888-48889	A. Sarachek Wichita State University Wichita, Kansas
Saccharomyces cerevisiae ATCC 48372	J.J. Ellis NRRL Peoria, Illinois
Schwanniomyces occidentalis ATCC 48422	N. Van Uden, Gulbenkian Institute of Science Portugal
Saccharomyces cerevisiae ATCC 48423	"
Saccharomyces cerevisiae ATCC 48425-48431, 48470	F. Radler Johannes Gutenberg University Germany
Debaryomyces polymorphus ATCC 48432	F. Uruburu Facultad di Ciencias Biol. Spain
Torulopsis glabrata ATCC 48435	E. Reiss Center for Disease Control Atlanta, Georgia

Yarrowia lipolytica ATCC 48436	Y. Ota University of Tokyo Japan
Saccharomyces cerevisiae ATCC 48487-48500	A.L. Extremera University of Granada Spain
Saccharomyces unisporus ATCC 48553, 48555	D. Yarrow CBS The Netherlands
Saccharomyces cerevisiae ATCC 48554, 48556	"
Torulopsis hansenii ATCC 48588	B. Wong Infectious Diseases Service New York, New York
Candida parapsilosis ATCC 48589	J.G. Meingassner Sandoz Forschung Austria
Kloeckera corticis ATCC 48612-48613	S. Goto Yamanashi University Japan
Hansenula populi ATCC 48773	H.J. Phaff University of California Davis, California
Kluyveromyces fragilis ATCC 48774-48777	"
Kluyveromyces lactis ATCC 48789-48799	A. Brunner U.N.A.M. Mexico
Saccharomyces cerevisiae ATCC 48800-48801	"
Saccharomyces cerevisiae ATCC 48866	T. Eklund Norwegian Food Research Institute Norway
Candida albicans ATCC 48867	R. Ruchel University of Gottingen Germany
Saccharomyces cerevisiae ATCC 48868-48869	M. Dove National Research Council Canada
Saccharomyces cerevisiae ATCC 48893-48894	S. Okamoto University of Tokyo Japan

Saccharomyces cerevisiae
ATCC 52051-52054, 52068

M.R. Culbertson
University of Wisconsin
Madison, Wisconsin

Schizosaccharomyces pombe
ATCC 52093-52098

J.L. Carrau
Universita de Caxias
Brasil

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II. Microbiology Research Group, Council for Scientific and Industrial Research, P.O. Box 395, Pretoria, 0001, South Africa. Communicated by J.P. van der Walt.

van der Walt, J.P. 1982. Hansenula euphorbiaphila sp. nov., a new, diploid heterothallic yeast species. Antonie van Leeuwenhoek 48:465-470.

Strains of an undescribed, diploid heterothallic yeast species, Hansenula euphorbiaphila, were recovered from material of a moribund, insect-infested specimen of Euphorbia ingens in the Groblersdal (Transvaal, South Africa) area. The new species shows some agreement with the conifer-associated taxa cited as Hansenula bimundalis var. bimundalis and Hansenula bimundalis var. americana. A description of the new species is given.

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van der Walt, J.P. 1981. Pichia meyerae, a new, sexually agglutinating, heterothallic, diploid yeast species. Antonie van Leeuwenhoek 48:383-388.

Eight diploid yeast strains, representative of an undescribed, sexually agglutinating, heterothallic Pichia species, have been recovered from insect infestations of Euphorbia ingens in South Africa. A description of the new species, Pichia meyerae, is given. Mating responses were not detected in interspecific mixtures of the mating types of Pichia meyerae and those of Pichia rhodanensis, Pichia wickerhamii, Pichia amylophila and Pichia mississippiensis.

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III. Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino, Moscow region 142292, USSR. Communicated by W.I. Golubev.

Below follows the abstract of my poster at the IXth International Specialized Symposium on Yeasts "Yeasts in Human Environment", Smolenice, Czechoslovakia, April 18-22, 1983.

The genus Nadsonia is characterized by bipolar bud fission, pedogamy, brown spherical ascospores with warty wall, psychrophily. This complex of features distinguishes it clearly from all the other genera, but speciation in this genus is the subject of confusion. The cause of the confusion resides in differences in the criteria used for species delimitation by authors of species and subsequent taxonomists. If the former differentiated species primarily on the basis of cellular morphology and cultural characteristics, the latter did it exclusively on the ground of differences

in physiological properties. The intent of this work was to evaluate whether the morphological demarcation of Nadsonia spp. agrees with a physiological one. In the study of 11 strains, including the type ones, the standard methods currently employed in yeast taxonomy were used.

Groupings of strains investigated

by physiological characteristics	11xn, 17N,268,269,270, 1653, 2531T	2532T	1573T, 1941 1942	
by ratio length: width of cells	11xn, 17N,268,269,270, 1653, 1941, 1942,2532T	2531T	1573T	
by formation of creeping pellicle	11xn, 17N,268,269,270, 1653, 2531T, 2532T		1573T, 1941 1942	
by morphology of colonies	11xn, 17N, 268, 269	270, 2531T 1653	2532T	1573T, 1941 1942

Of the three physiological groups corresponding to current definitions of species, the single strain of N. fulvescens (2532) is distinguished remarkably by its ability to utilize the greatest number of carbon compounds. In contrast to the width, the cells of the strains vary significantly in length. Studied strains are allocated into three groups by ratio length: width of cells. Two of them contain only the type strains of N. elongata (2531) and of N. commutata (1573), while the third one contains all the other strains. Only the cultures of N. commutata do not form creeping pellicles in liquid media. The strains are quite variable in morphology of colonies on glucose-peptone gelatin. A comparison of physiological and morphological groups reveals their disagreement in composition, i.e., different critera employed for species delineation result in different taxonomic entities. It is evident that the speciation in the genus Nadsonia is still an open question and requires further studies.

Recent publications:

Mozhilevskaya, L.P., Gagarina, V.A., Golubev, W.I. (1982). Occurrence and taxonomic characterization of methanol-assimilating yeasts. Mikrobiologitsheskii Jurnal, 44, No. 2, 40-43.

Gulevskaya, S.A., Manukyan, A.R., Golubev, W.I. (1982). Cytological studies of capsule formation in yeast during the course of its growth. Mikrobiologiya, 51, No. 2, 287-291.

Golubev, W.I., Manukyan, A.R., Lazarev, P.I., 1983. The functions of yeast capsules. Jurnal obshchei biologii (in press).

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IV. Department of Food Science & Technology, University of California, Davis, California 95616. Communicated by H.J. Phaff.

W.T. Starmer and H.J. Phaff participated in an expedition on the National Science Foundation research vessel "Cape Florida" during May 1982 in the Caribbean Sea. Our purpose was to expand our knowledge of yeasts occurring in rotting Opuntia and columnar cacti growing on various islands. We

collected more than 300 strains of yeast on the islands of Hispagnola (Haiti and the Dominican Republic), Montserrat, Tortola, and Prickly pear island near Virgin Gorda. The identification of the yeasts is now completed and the results are being prepared for publication. A second expedition is planned in November, 1983 to the islands of Inagua, Navassa, Jamaica, and Grand Cayman.

Below follows abstracts of recent publications.

1. W.T. Starmer and H.J. Phaff. Microbial Ecology (submitted for publication)

Abstract

A survey was made of yeast species associated with the decaying pads of three prickly pear cacti (Opuntia phaeacantha, O. ficus-indica and O. lindheimeri) in Arizona and Texas. Yeast communities from twelve localities were compared among localities, among Opuntia species and with previous data on yeast communities associated with columnar cacti. The results indicate that Opuntia necroses contain relatively more species of yeast in their communities than columnar necroses. It is argued that differences in chemistry of the opuntias and columnar cacti account for the difference in yeast community structure. It is further hypothesized that the differences in yeast community structure have been important in the evolution and maintenance of species diversity for Drosophila species which live in the decaying stems or cladodes of various cacti. Most of the yeast community evolution in the cacti is postulated to have proceeded by evolution in situ and not by additions and replacements from outside of the system.

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2. D.L. Holzschu, H.J. Phaff, Joanne Tredick and D. Hedgecock. Pichia pseudocactophila, a new species of yeast occurring in necrotic tissue of columnar cacti in the North American Sonoran Desert. Can. J. Microbiol. (accepted for publication).

A description is given of Pichia pseudocactophila, a new species of yeast which is closely related to Pichia cactophila. P. pseudocactophila is heterothallic and produces four-spored asci, whereas P. cactophila is homothallic and its asci contain a maximum of two spores. Their morphological and physiological properties and G+C contents of their nuclear deoxyribonucleic acids (DNAs) are similar, but the DNA of P. pseudocactophila shows only 35% homology with the DNA of P. cactophila. In addition, strains of P. pseudocactophila have electrophoretic enzyme patterns for glucose-6-phosphate dehydrogenase, hexokinase-1, hexokinase-2, and phosphoglucomutase that allow them to be distinguished from P. cactophila strains. Lastly, P. pseudocactophila has been found only in rotting tissue of columnar cacti (Pachycereus pringlei and close relatives) in Mexico and southern Arizona, whereas P. cactophila is a host plant generalist and is distributed worldwide in all cactus species so far investigated.

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3. Eveline Guého[1], Joanne Tredick and H.J. Phaff. DNA Base Composition and DNA Relatedness Among Species of Trichosporon Behrend. Antonie van Leeuwenhoek (submitted).

[1]Unite de Mycologie de l'Institut Pasteur, 25 rue du Dr Roux, 75724 Paris Cedex 15, France.

The molar percentage of guanine + cytosine (mol% G+C) was measured of the nuclear DNA of 28 species (30 strains investigated) of yeasts classified in the genus Trichosporon. This criterion, together with biochemical characteristics, suggested the separation of the organisms studied into two groups. The first group, which appears related to the Ascomycetes, includes 13 species with a G+C content lower than 50 mol% (34.7 -48.8), and lacks urease (except T. margaritiferum). The second group appears closely related to the Basidiomycetes and includes 15 species with a G+C content higher than 50 mol% (57-64) and has the ability to hydrolyse urea.

A DNA homology experiment with T. beigelii and 12 other species of the second group showed very low values of complementarity with T. beigelii-labeled DNA. All these species must be considered as taxa other than T. beigelii. Their real relationships remain to be determined.

4. J.S.F. Barker, G.L. Toll, P.D. East, M. Miranda, and H.J. Phaff (1983). Heterogeneity of the yeast flora in the breeding sites of cactophilic Drosophila. Can. J. Microbiol. 29:6-14 (for abstract see Yeast Newsletter XXXI No. 2, p. 57).

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V. Levures, Biologie Végétale 2 cycle-Bât. 405, Université Claude Bernard (Lyon 1), 43, Bd du 11 Novembre 1918, Villeurbanne, F. 69622 Villeurbanne Cedex, France. Communicated by M.C. Pignal.

1. R. Montrocher, J.B. Fiol, and F.H. Jacob participated in the 9th International Specialized Symposium on Yeast, Smolenice Castle, Czechoslovakia in April 1983 and presented the following posters.

(a) R. Montrocher and M.L. Claisse - Cytochrom spectra in the yeast genus Candida.

(b) J.B. Fiol - Biosystematics of yeast: application to the genus Kluyvermyces v.d. Walt emend. v.d. Walt.

This poster emphasizes the difficulty of speciation based solely on physiological and biochemical criteria which basically do not reflect the genome. In contrast, characteristics reflecting the genome more closely (intracellular enzymes, vitamin requirements, G+C content, DNA-DNA complementarity, cytochrome spectra) should give a more accurate picture of the affinities and evolutionary divergence among yeast strains.

(c) - F.H. Jacob et S. Poncet - Ethanol fermentation of inulin by yeasts.

This study has been carried out to select strains of yeasts able to ferment inulin without previous chemical or physical hydrolysis. This ability is very important for industrial ethanol production from Jerusalem artichoke. Indeed, Helianthus tuberosus may become in the near future an interesting crop for energy production. Strains of twelve species have been studied on semi-synthetic medium with 150 g

of inulin per liter (analogous concentration to that of Jerusalem artichoke musts) by evaluation of CO_2 production under anaerobic conditions.
Amongst the most competitive strains, Kluyveromyces marxianus and Torulopsis colliculosa were already pointed out by Guiraud and colleagues (1982).
Strains of Kluyveromyces cicerisporus, Candida macedoniensis and Candida utilis also showed good kinetic characteristics of fermentation. Experiments have been carried out on inulin fermentation to evaluate the action of different parameters, such as temperature and ethanol concentration of the medium.
The results obtained during these preliminary investigations were confirmed on Jerusalem artichoke musts.

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2. The following paper has been submitted to Mycopathologia:

S. Poncet, J.B. Fiol et G. Billon-Grand - Hybridation ADN-ADN chez quelques espèces du genre Hansenula. Conséquences systématiques.

Abstract

The genus Hansenula was considered for a long time a good object for phylogenetic research. In 1969, Wickerham proposed an evolutionary scheme based upon morphological, physiological and ecological criteria. Recently, relatedness among yeasts of this genus were analysed by DNA-DNA hybridization in liquid medium. H. anomala var. anomala (G+C content: 33.1%) was compared with H. anomala var. schneggii (37.6%), H. subpelliculosa (33.8%), H. ciferrii (33.1%), H. holstii (37%) belonging to the same line 2, and also with H. beckii (38.3%) line 3, H. sydowiorum (40.1%) and H. muscicola (37.1%).

These results showed little relatedness between H. anomala var. anomala/H. ciferric, and H. anomala var. anomala/H. subpelliculosa. On the other hand, H. anomala var. schneggii shared 89.5% of its nucleotide sequence with H. anomala var. anomala. These 2 organisms are considered to represent the same species. H. holstii showed 67.1% complementarity with H. anomala var. anomala: H. holstii is considered a valid species, different from H. anomala var. anomala, but H. muscicola with 72.5% relatedness to H. anomala var. anomala could be considered as a "limit species". An unexpected finding was that H. beckii was closely related to H. anomala var. anomala (84.8%). These data suggest the inadequacy of current criteria used to establish the phylogenetic lines in the genus Hansenula.

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3. In September 1983, Z. Hmama, a Moroccan student, will finish his Thèse de Spécialité on a study of the systematics of the genera Pichia, Hansenula, Ambrosiozyma, Hormoascus, and Hyphopichia. He has studied the relationships between Pichia, Hansenula and related genera by using serological criteria (immunodiffusion and immunoelectrophoresis), enzymatic properties, G+C content, and type of coenzyme Q. He has also developed a study of Pichia spp. with spherical ascospores.

* * *

VI. Departamento de Patologia Tropical, Instituto Nacional de Pesquisas da Amazonia, 69000 Manaus, Brazil. Communicated by W.Y. Mok.

Below follows abstracts of three studies from our Institute.

1. Wai Yin Mok, Regina C.C. Luizao, and Maria do Socorro Barreto da Silva, 1982. Isolation of Fungi from Bats of the Amazon Basin, Appl. Environ. Microbiol. 44:570-575.

A total of of 2,886 bats captured in the Amazon Basin of Brazil were processed for the isolation of fungi. From the livers, spleens, and lungs of 155 bats (5.4%), 186 fungal isolates of the genera Candida (123 isolates), Trichosporon (26 isolates), Torulopsis (25 isolates), Kluyveromyces (11 isolates), and Geotrichum (1 isolate) were recovered. Seven known pathogenic species were present: Candida parapsilosis, C. guilliermondii, C. albicans, C. stellatoidea, C. pseudotropicalis, Trichosporon beigelii and Torulopsis glabrata. Twenty-three culture-positive bats showed identical fungal colonization in multiple organs or mixed colonization in a single organ. The fungal isolation rates for individual bat species varied from 1 fungus per 87 bats to 3 fungi per 13 bats, and the mycoflora diversity for members of an individual fungus-bearing bat species varied from 16 fungi per 40 bats to 7 fungi per 6 bats. Of the 38 fungal species isolated, 36 had not been previously described as in vivo bat isolates. Of the 27 culture-positive bat species, 21 had not been previously described as mammalian hosts for medically or nonmedically important fungi.

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2. W.Y. Mok, 1982. Nature and Identification of Exophiala werneckii, J. Clin. Microbiol. 16:976-978.

The morphological and physiological characteristics of 44 isolates of Exophiala werneckii recovered from human and environmental sources were indistinguishable from 2 isolates that caused tinea nigra. Casein hydrolysis and inability to decompose tyrosine differentiate E. werneckii from Exophiala jeanselmei, Exophiala spinifera and Wangiella dermatitidis.

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3. J.R. Arias, R.D. Naiff, M.F. Naiff, W.Y. Mok, and M.M.R. Almeida[1], 1982. Trans. Roy. Soc. Trop. Med. Hyg. 76:705-706.

Isolation of Histoplasma capsulatum from an armadillo (Dasypus novemcinctus) in the eastern Amazon of Brazil.

Naturally acquired histoplasmosis has been documented from several wild animals associated with the forest floor (Taylor & Shacklette, 1962). In the Brazilian Amazon Basin, Lainson & Shaw (1975) uncovered benign Histoplasma infection in the viscera of four rodents (Proechimys guyannensis) in Para State during their studies on animal reservoirs of Leishmania. Moraes & Almeida (1976) reported the isolation of H. capsulatum from soil samples taken from a backyard filled with chicken manure in Mato Grosso State. Here we record for the first time a wild armadillo, Dasypus novemcinctus, caught in the eastern Amazon, with natural histoplasmosis.

[1]Instituto Evandro Chagas, Caixa Postal 3, 66000 Belém, Pará, Brazil.

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VII. Vallabhbhai Patel Chest Institute, University of Delhi, Delhi-110007, P.O. Box No. 2101, India. Communicated by M. Pal.

Below follow several abstracts of papers dealing with medically important yeasts.

1. Pal, M. (1980). Studies on the Mycoses caused by Aspergillus fumigatus and Cryptococcus neoformans in Animals. Ph.D. thesis submitted to Kumaun University Nainital-26300 (India).
This work was conducted under the guidance of Professor B.S. Mehrotra, Dean, Faculty of Science Kumaun University, Nainital-26300 (India).
Very recently my Ph.D. thesis work has been awarded the "Jawaharlal Nehru Award" by the Indian Council of Agricultural Research, New Delhi.

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2. Pal, M. and Randhawa, H.S. (1976). Caprine mastitis due to Cryptococcus neoformans. Sabouraudia, 14:261-263.

Abstract

The isolation of Cryptococcus neoformans from milk and its demonstration by direct microscopy has been reported in a case of caprine mastitis. This is believed to be the first instance of caprine mastitis in which C. neoformans has been implicated as the etiologic agent.

3. Pal, M., Khan, Z.U. and Randhawa, H.S. (1979). Observations on niger seed creatinine agar as a selective medium for Cryptococcus neoformans. Indian Journal of Microbiology, 19:19-22.

Abstract

Cryptococcus neoformans is reported from 39 of 489 samples of avian excreta, soil and bat droppings, using Staib's Guizotia abyssinica seed agar for the selective isolation of C. neoformans. To the best of our knowledge, there is no previous report on the isolation of C. neoformans, from 5 avian species, namely Ara ararauna, Ara Chloroptena, Centropus Sinensis, Estrilda amandava and Melopsittacus undulatus. It is suggested that a wider application of Staib's Guizotia abyssinica seed agar would led to a better understanding of the ecology of C. neoformans.

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4 Pal, M. (1980). Association of Candida albicans with crop lesions in chicks, Indian Poultry Review, 12:33-34.

Abstract

During a period of two years, i.e., from March 1978 to March, 1980, two hundred and seventy one crops were cultured on Sabouraud's dextrose agar

with Chloramphenicol. These clinical specimens were obtained from the same number of birds of different age groups and both sexes. In all, 19 isolates of Candida albicans were recovered, giving a prevalence of 7.0 per cent. The autopsy findings revealed ulcers on crops.

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5. Pal, M. and Mehrotra, B.S. 1982. Studies on the efficacy of sunflower agar medium for the isolation and identification of Cryptococcus neoformans. Arogya-Journal of Health Sciences, 8:74-79.

Abstract

A medium with sunflower seeds was evaluated for the isolation and identification of Cryptococcus neoformans from a wide variety of materials. In 175 clinical samples and 397 environmental materials examined, 3 strains (1.7%) and 13 strains (3.3%), respectively were isolated on sunflower medium as compared with Sabouraud's medium, which yielded 1 strain (0.6%) and 3 strains (0.7%), respectively. The development of brown coured colonies of C. neoformans on sunflower medium within 3-7 days of incubation at 25°C was extremely helpful in the early identification of this pathogen. It is hoped that wider use of this medium, which has hitherto not received much attention in laboratory studies of C. neoformans, would help in the epidemiological investigation or laboratory study of C. neoformans. The authors are of the opinion that sunflower agar medium may be used as a very good selective medium in the rapid isolation and identification of C. neoformans both from clinical and environmental materials.

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VIII. Department of Food Science, Louisiana State University, Baton Rouge, Louisiana, 70803. Communicated by S.P. Meyers.

The following is an abstract of a presentation before "Wetlands: Ecology and Management" (Proc. 1st Internat. Wetlands Conference, New Delhi, India, Sept. 1980. B. Gopal, R.E. Turner, R.G. Wetzel & D.F. Whigham, eds., Printed 1982)

Iron Concentration by Yeasts of the Spartina alterniflora Plant Ecosystem.

Samuel P. Meyers

Abstract

Studies of the Spartina alterniflora salt marsh in Louisiana have revealed noteworthy concentrations of yeasts of the sporogenous genera Pichia and Kluyveromyces within the aerobic portion of the plant rhizosphere as well as in the intravascular spaces of the intact viable culm. Pichia spartinae occurs in concentrations as great as 9×10^7 viable cells g^{-1} in intraculm cell liquid and tissue, while Kluyveromyces drosophilarum is found in concentrations often exceeding 90,000 colony forming units cm^{-3} sediment. The latter species is an indigenous component of the rhizosphere mycota. Both species are the dominant yeasts of the Spartina community marsh in contrast to the diversity of asexual taxa usually reported from other aquatic localities. Strains of K. drosophilarum actively produce

pulcherrimin, a ferric salt of pulcherriminic acid, characterized by iron chelation properties. Studies have been conducted to ascertain the ability of both yeasts to concentrate ferric and ferrous iron in axenic culture. Rates of uptake, using ^{59}Fe, have been examined in liquid and solid media, with particular attention directed to iron concentration by K. drosophilarum. Rapid uptake of iron from liquid and agar media is up to 0.0041 μ g ^{59}Fe over a 48 hr period. Uptake growth curves of the yeast show significant iron concentration, with incorporation into cell pool constituents. The noteworthy extant biomass of these two yeast species, and their heretofore unreported uptake of iron, suggests an important role for such microorganisms in the aerobic salt marsh iron cycle.

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IX. Queen Elizabeth College (University of London), Microbiology Department, Atkins Building, Campden Hill Road, London W8 7AH, England. Communicated by R.K. Poole.

Below follows abstracts of three articles that will appear shortly in the Journal of General Microbiology.

1. Ian Salmon and Robert K. Poole (1983). The Cell Cycle of the Budding Yeast Sterigmatomyces halophilus: Culture Fractionation by Zonal Centrifugation and the Accumulation of DNA, RNA and Protein. J. Gen. Microbiol. 129: (in press).

Abstract

Sterigmatomyces halophilus is an unusual budding yeast in which daughter cells are formed, remote from the mother cell, on fine projections called sterigmata. Some fundamental properties of the cell cycle have been explored by separating cells from an exponentially growing culture into size, and thus age, classes by density-gradient centrifugation. Rate separations on high capacity, high resolution, equivolumetric gradients of sucrose, or, alternatively, isopycnic separations on gradients of Urografin revealed consistent and reproducible patterns of accurmulation of DNA, RNA and protein through the cell cycle. Total DNA accumulation was stepwise, synthesis occurring late in the cycle, whilst protein accumulated continuously with no evidene for the discontinuities reported in some other lower eukaryotes. Total RNA accumulation, measured either colorimetrically or by long-term incorporation of radioactively-labeled uracil was transiently elevated early in the cycle and then accumulated continuously. A mathematical analysis of the volume distributions of the cells in fractions from the gradients showed that there is a hyperbolic relationship between cell age and size but that, to a first approximation, measurements of cell size (and density) are direct measures of age. The results are discussed with reference to (1) the unusually high buoyant density of this yeast, (2) the resolution of zonal cell separation methods and (3) macromolecular accumulation in the cell cycles of other eukaryotic microorganisms.

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2. Ian Salmon and Robert K. Poole (1983). The Cell Cycle of the Budding Yeast Sterigmatomyces halophilus: Oscillations in the Amounts and Activities of the Terminal Components of the Respiratory Chain. J. Gen. Microbiol. 129: (in press).

Abstract

Cells harvested from exponentially growing cultures of the budding yeast Sterigmatomyces halophilus were fractionated according to their age in the cell cycle by isopycnic-zonal centrifugation in Urografin gradients. Activities of five enzymes were assayed in cell-free extracts, prepared using a French pressure cell. The activities of catalase and three enzymes of the mitochondrial inner membrane (NADH dehydrogenase, succinate dehydrogenase and cytochrome c oxidase) doubled during the cell cycle but showed complex oscillatory patterns. Acid phosphatase activity increased continuously during the cell cycle. Fourth-order finite difference analysis of low-temperature difference spectra showed that the levels of three b-type cytochromes increased continuously during the cycle. In contrast, amounts of cytochromes c_1, c and aa_3 oscillated over one cycle, with cytochromes c and aa_3 rising to two maxima per cycle in phase with cytochrome c oxidase activity. Liganding of redox-active metals, and discontinuous synthesis and proteolysis of apocytochromes are discussed as possible mechanisms for cell-cycle dependent fluctuations in the composition and function of the respiratory chain.

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3. Ian Salmon and Robert K. Poole (1983). The Cell Cycle of the Budding Yeast Sterigmatomyces halophilus: Levels of Mitochondrial Components in Mother and Bud Cells. J. Gen Microbiol. 129: (in press).

Abstract

Sterigmatomyces halophilus is an unusual budding yeast in which daughter cells are formed remote from the mother cell on fragile projections called sterigma. These sterigma are readily disrupted by ultrasonication, allowing easy detachment of immature buds from their mother cells. Fractions containing cells at different stages of the cell cycle, obtained by isopycnic fractionation of exponentially growing cultures, were treated ultrasonically to produce a mixture of immature buds, mothers and mother-bud doublets. Rate-sedimentation of these suspensions using sucrose gradients produced three discrete bands corresponding to each of these populations. The activities of succinate dehydrogenase and cytochrome c oxidase were measured in extracts prepared from (1) the cells recovered from the slowest sedimenting band (i.e., immature buds) and (2) the original population (i.e., mother-bud doublets). The activity of each enzyme, expressed on a per cell basis, varied in phase with the observed activity in the mother-bud doublets during the cell cycle, and when expressed as specific activity was the same in both daughter and mother-daughter pairs. This indicates that these two enzymes (and by implication inner mitochondrial membrane) are evenly distributed between mother and developing daughter cells during the cell cycle.

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X. Department of Microbiology, Ahmadu Bello University, Zaria, Nigeria. Communicated by Richard N. Okagbue.

Below follows a report of a recent study (partially conducted at the University of California, Davis).

Okagbue, R.N. and Lewis, M.J.* Electron microscopy and cytochemical studies on the relationship between the integrity of the cell envelope of Phaffia rhodozyma and extractability of astaxanthin from this yeast.

Astaxanthin, a potentially useful pigment produced by P. rhodozyma, is not extractable by treatment of the intact yeast with acetone. However, a previous study showed that under suitable conditions, growth of the yeast in mixed culture with Bacillus circulans WL-12 made the pigment extractable. This was attributed to a wall-lytic enzyme complex produced by the bacillus. An attempt has been made in this study to correlate the extractability of astaxanthin with possible alterations in the physical and chemical integrity of the cell envelope of P. rhodozyma. Samples taken from the mixed culture with B. circulans WL-12 and from a pure culture of the yeast (control) were examined by transmission electron microscopy and by two cytochemical methods, namely, a modified gram stain and the diazonium blue B (DBB) stain.

Electron micrographs confirmed the role of B. circulans WL-12 in the yeast cell wall modification: P. rhodozyma cells in 48 hr mixed culture samples, which contained relatively low levels of the bacillus and low lytic activity, appeared unmodified and resembled those of corresponding control samples. Deteriorative changes in the integrity of the yeast cell envelope were apparent by 72 hr when abundant growth of the bacillus had occurred and a high level of lytic acitivity was detectable in the mixed culture: capsular materials around the yeast cells were considerably reduced, and many of the cells had undergone complete lysis, apparently due to internal disorganization and cell wall rupture. It seemed that intracellular modification of P. rhodozyma accompanied or was induced by extracellular lytic activity on its walls. The electron micrographs of control samples at 72 hr were not significantly different from those of 48 hr.

The gram stain as modified by Bianchi (1) was also applied to samples of the mixed culture. All yeast cells present in duplicate fields (light microscopy) in 48 hr samples were gram positive and indicated that cell wall modification had not occurred at that time. In contrast, only 6% of the cells in corresponding fields of 72 hr samples retained gram positivity. This showed that considerable wall modification or disruption had occurred. At that time most of the pigment in cell pellets was extractable.

The DBB test, which was also applied to samples of the mixed culture, characteristically differentiates basidiomycetous from ascomycetous yeasts. It has been shown to be a function of the cell wall and to depend on culture age and other factors (2). The test was negative in this study up to 40 hr of the mixed culture. Samples showed a positive (delayed) reaction from 48 to 54 hr. Intensely positive reactions were observed with 58-72 hr samples and corresponded with 85-90% extractabilty of astaxanthin contained within cell pellets.

In general, these results indicate that extractability of astaxanthin from P. rhodozyma was due to alterations in the integrity of the yeast cell walls caused by lytic activity of B. circulans WL-12 and probably also to accelerated aging of the yeast in the mixed culture.

*This study was done under the supervision of Professor M.J. Lewis at the Brewing Laboratory, University of California, Davis, U.S.A.

(1) Bianchi, D.E. 1965.
Differential staining of yeast for purified cell walls, broken cells and whole cells.
Stain Technology 40:79-82

(2) Tevayanond, R. 1981.
On the nature of the reaction of Diazonium Blue B with basidiomycetous yeasts.
Ph.D. thesis, University of California, Davis.

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XI. Albert-Ludwigs-Universität, Biochemisches Institut, D-7800 Freiburg I. Br., Hermann-Herder-Str. 7, Federal Republic of Germany. Communicated by Dieter H. Wolf.

Below follows the abstract of our recent work concerning yeast aminopeptidases and dipeptidyl aminopeptidases. The paper is in press in Archives of Biochemistry and Biophysics.

Tilman Achstetter, Claudia Ehmann and Dieter H. Wolf (1983).

Aminopeptidases and Dipeptidyl Aminopeptidase of Yeast Revisited

Using nine different L-aminoacyl-4-nitroanilides and four different dipeptidyl-4-nitroanilides we searched for aminopeptidases and dipeptidyl aminopeptidases active at pH 7.5 and (or) pH 5.5 in logarithmically growing and stationary phase cells of Saccharomyces cerevisiae. Ion exchange chromatography was used to separate the proteins of the soluble cell extract. Besides the three already characterized aminopeptidases, - aminopeptidase I (P. Matile, A. Wiemken and W. Guyer (1971) Planta (Berl.) 96, 43-53; J. Frey and K.H. Rohm (1978) Biochim. Biophys. Acta 527, 31-41), aminopeptidase II (J. Frey and K.H. Rohm (1978) Biochim. Biophys. Acta 527, 31-41; J. Knuver (1982) Thesis, Fachbereich Chemie, Marburg, F.R.G.) and aminopeptidase Co (T. Achstetter, C. Ehmann and D.H. Wolf (1982) Biochem. Biophys. Res. Commun. 109, 341-347) twelve additional aminopeptidase activities were found in soluble cell extracts eluting from the ion exchange column. These activities differed from the characterized aminopeptidases in one or more of the parameters, such as charge, size, substrate specificity, inhibition pattern, pH optimum for activity and regulation. also, a particulate aminopeptidase, termed aminopeptidase P, was found in the insoluble fraction of disintegrated cells. Besides the described particulate x-prolyl-dipeptidyl aminopeptidase (M.P. Suarez Rendueles, J. Schwencke, N. Garcia-Alvarez and S. Gascon (1981) FEBS Lett. 131, 296-300), three additional dipeptidyl aminopeptidase activities of different substrate specificity were found in the soluble extract.

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XII. Institute of Marine Resources, University of California, Davis, CA 95616. Communicated by D.M. Ogrydziak.

Below follow several abstracts of recent publications from our group.

1. David M. Ogrydziak and Stephen J. Scharf (1982). Alkaline Extracellular

Protease Produced by Saccharomycopsis lipolytica CX161-1B. J. Gen. Microbiol. 128:1225-1234.

Saccharomycopsis lipolytica CX161-1B, a strain suitable for genetic studies, when grown at near neutral pH produced a single alkaline extracellular protease, lower levels of acid extracellular protease(s) and no neutral extracellular protease. The alkaline protease was purified to homogeneity (as determined by polyacrylamide gel electrophoresis) by ultrafiltration, gel filtration and DEAE-cellulose chromatography. The molecular weight of the enzyme was estimated by gel filtration to be 27000-30000, and the isoelectric point was pH 5-7. The purified enzyme had an alkaline pH optimum (pH 9-10). It was completely inhibited by phenylmethylsulphonyl fluoride, reversibly inhibited by EDTA, partially inhibited by o-phenanthroline, and not inhibited by dithiothreitol, N-ethylmaleimide or 4-hydroxymercuribenzoic acid, indicating that it is a serine protease. The content of sulphur amino acids was determined, and the purified protease contained no more than 1.8% carbohydrate as determined by the phenol-sulphuric acid method. The N-terminal amino acid sequence (25 residues) was determined; the N-terminal amino acid was alanine.

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2. David M. Ogrydziak, Suk-Chun Cheng and Stephen J. Scharf (1982). Characterization of Saccharomycopsis lipolytica Mutants Producing Lowered Levels of Alkaline Extracellular Protease. J. Gen Microbiol. 128:2271-2280.

Mutants affected in production of alkaline extracellular protease (xpr mutants) have been characterized. The alkaline protease produced by the xpr mutants, except for that of the structural gene mutant, was indistinguishable from the wild-type protease on the basis of isoelectric focusing in polyacrylamide gels, SDS-PAGE and thermal stability. Some revertants of xpr mutants were temperature sensitive for protease production, but the thermal stability of the revertant protease was not altered. The xpr mutants grew as rapidly as the wild-type with glutamic acid, leucine or urea as sole nitrogen source. The pleiotropic xpr mutants which produced lowered levels of extracellular RNAase also produced less extracellular acid proteases (4 to 40% of wild-type). These results suggest that the pleiotropic xpr mutants may affect secretion. However, production of phosphatase(s) (which was secreted but located primarily in the cell envelope) was much less affected in these mutants (65 to 100% of wild-type). A possible explanation for these results is that at least one step (component) of the secretion pathway for the extracellular proteases and RNAases is not shared by the phosphatase(s).

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3. David Ogrydziak, John Bassel* and Robert Mortimer* (1982). Development of the Genetic Map of the Yeast Saccharomycopsis lipolytica. Mol. Gen. Genet. 188:179-183.

*Division of Medical Physics, Donner Laboratory, University of California, Berkeley, California 94700, USA.

Summary

Tetrad and random spore analyses have been used to further develop the genetic map of Saccharomycopsis lipolytica. Mutations in 23 new nuclear genes have been isolated. Eight genes have been located on linkage fragment 1, 4 on fragment 2, 2 on fragment 5, and 3 on fragment 6. Linkage fragments 3 and 4 have been shown to be linked, and this fragment now contains 12 markers. A tentative map of the linkage fragments 1 and 3 is presented (Fig. 1). Markers exhibiting possible centromere linkage have been identified. Interference estimates suggest that there is little interference in S. lipolytica.

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4. Tetsuji Yamada and David M. Ogrydziak (1982). Extracellular Acid Proteases Produced by Saccharomycopsis lipolytica. J. Bacteriol. 154:23-31.

Saccharomycopsis lipolytica CX161-1B produced at least three extracellular acid proteases during exponential growth in medium containing glycerol, Difco Proteose Peptone, and mineral salts at pH 3.4 (Difco Laboratories, Detroit, Mich.). Little extracellular acid protease activity was produced with glutamic acid as the sole nitrogen source, somewhat higher levels were obtained with peptone, and much higher levels were obtained with Difco Proteose Peptone. The relative amounts of the three proteases varied during growth on Difco Proteose Peptone, which suggested that the proteases were not coordinately regulated. The proteases were purified to near homogeneity (as determined by sodium dodecyl sulfate-polyacrylamide gel electrophoresis) by use of ultrafiltration, gel filtration, and DEAE-Sephacel and hydroxylapatite chromatography. Protease I had a molecular weight near 28,000, an isoelectric point of pH 4.9, and a pH optimum of 3.5. Protease II had a molecular weight near 32,000 and a pH optimum of 4.2. Protease III had a molecular weight near 36,000, an isoelectric point of 3.8, and a pH optimum of 3.1. All three proteases were glycoproteins, proteases I, II, and III contained 25, 12, and 1.2% carbohydrate, respectively. The proteases were inhibited by pepstatin and 1,2-epoxy-3-(4-nitrophenoxy) propane and were largely insensitive to diazoacetyl-DL-norleucine methylester and to compounds which inhibit the serine, sulfhydryl, or metallo-proteases.

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XIII. Biological Institute, Faculty of Science, Nagoya University, Nagoya 464, Japan. Communicated by Naohiko Yanagishima.

The publications listed below represent recent work from our Institute.

1. A. Sakurai, Y. Sato, K.H. Park, N. Takahashi, N. Yanagishima, and I. Banno. 1980. Isolation and chemical characterization of a mating pheromone produced by Saccharomyces kluyveri. Agric. Biol. Chem. 44:1451-1453 (see also Yeast Newsletter Vol. XXXI, No. 2, p. 78).

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2. Yoshiyuki Nakagawa and Naohiko Yanagishima. 1982. Changes in Production of the Mating-Type-Specific Glycoproteins, Agglutination Substances in Association with the Mating Type Interconversion in Homothallic Strains of the Yeast, Saccharomyces cerevisiae. Mol. Gen. Genet. 185:207-210.

Summary

Sexual activity in homothallic strains of Saccharomyces cerevisiae was investigated. We succeeded in culturing homothallic haploid cells without conjugation, by lowering the pH value of the culture medium. In spore cultures of a homothallic strain both a and α pheromones were detected. Agglutination substances of a and α mating types were detected in homothallic haploid cells from spore cultures in early logarithmic phase regardless of mating type information at the HML and HMR loci, but either a or α agglutination substance was detected predominantly in homothallic haploid cells from spore culture in late logarithmic phase, depending on mating type information at the HML and HMR loci.

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3. Hiroshi Tohoyama[1] and Naohiko Yanagishima. 1982. Control of the Production of the Sexual Agglutination Substances by the Mating Type Locus in Saccharomyces cerevisiae: Simultaneous Expression of Specific Genes for a and α Agglutination Substances in matα2 Mutant Cells. Mol. Gen. Genet. 186:322-327.

[1]Biological Institute, Faculty of Science, Ehime University, Matsuyama 790, Japan.

Summary

The effect of mata1, matα1 and matα2 mutation in the mating type locus on the production of the sexual agglutination substances responsible for sexual agglutination was examined. Cells carrying the mata1 mutation produced a agglutination substance as efficiently as cell of MATa. Cells carrying matα1 showed neither α nor a agglutination ability. Cells carrying matα2 behaved just like matα1 cells at 28°C, but at 36°C, or in glycerol or acetate medium, they produced a agglutination substance, showing a agglutination ability. matα2 cells showed α agglutination ability even at 28°C when treated with 2-mercaptoethanol which inactivates the a agglutination substance selectively, indicating that both a and α agglutination substances were produced simultaneously at 28°C, but no agglutination ability was expressed by mutual interaction of these two substances. This indication was confirmed by the fact that α agglutination substance was detected in the cell wall fraction of matα2 cells cultured at 28°C, by treatment with 2-mercaptoethanol followed by DEAE cellulose column chromatography. In the light of the above results and the α1-α2 hypothesis, the mechanism of regulation of production of agglutination substance by the mating type locus is discussed.

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4. Hiroaki Fujimura, Naohiko Yanagishima, Akira Sakurai[1], Chieko Kitada[2], Masahiko Fujino[2], and Isao Banno[3]. 1982. Sex Pheromone of α mating Type in the Yeast Saccharomyces kluyveri and its Synthetic Analogues in Relation to Sex Pheromones in Saccharomyces cerevisiae and Hansenula wingei. Arch. Microbiol. 132:225-229.

[1]The Institute of Physical and Chemical Research, Wako-shi, Saitama 351, Japan

[2]Central Research Division, Takeda Chemical Industries, Ltd., Yodogawa-ku, Osaka 532, Japan
[3]Institute for Fermentation, Osaka, Yodogawa-ku, Osaka 532, Japan

Abstract

Three analogues of the peptidyl pheromone, α pheromone of Saccharomyces kluyveri, synthesized based on the amino acid sequence proposed by Sato et al. (Agric Biol Chem 45:1531-1533, 1981) were tested for both shmoo-inducing and agglutinability-inducing actions. Purified natural α pheromone of the yeast showed the highest activity among the peptides tested. When methionine in the peptides was oxidized, the activity decreased significantly. αPheromone of S. kluyveri induced sexual agglutinability in a cells of Saccharomyces cerevisiae, and shmoo in a cells of S. cerevisiae and S. kluyveri. a Pheromone of S. kluyveri had no agglutinability-inducing action on α cells of S. cerevisiae. a Cells of S. kluyveri inactivated only α pheromone of the same species, but a cells of S. cerevisiae inactivated α pheromones of both S. cerevisiae and S. kluyveri.

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5. Kayoko Nishi and Naohiko Yanagishima. 1982. Temperature Dependency of Induction of Sexual Agglutinability by α Pheromone in the Yeast Saccharomyces cerevisiae. Arch. Microbiol. 132:236-240.

Abstract

When α pheromone-pretreated cells of an inducible a strain of Saccharomyces cerevisiae carrying the inducible gene saa1 were incubated in a growth medium at 28°C, induction of sexual agglutinability began after a 10 min lag period. If the cells were incubated at 38°C during the lag period, no induction occurred even after incubation at 28°C. Contrary to this, if the cells were incubated at 28°C during the lag period, almost complete induction occurred, even after transfer to 38°C. Temperature shift experiments revealed that 5 min incubation at 28°C was necessary for the initiation of the temperature-sensitive period and further 5 min incubation for the completion of the period. The temperature-sensitive period was sensitive to phenylmethylsulfonyl fluoride.

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XIV. Brooklyn College of The City University of New York, Brooklyn, New York 11210, Department of Biology. Communicated by Nasim A. Khan.

Below follows the summary of a paper to be presented at the Molecular Biology Yeast Meeting to be held at Cold Spring Harbor Laboratory in the month of August 1983.

N.A. Khan, A. Mendelsohn, H. Eisenberg and S. Gaskin (1983). Concomitant Reversion of the Petite Mutants Induced by Manganese on Glycerol and Maltose Plates in Yeast.

Abstract

In the absence of the nuclear gene PMU-1 (petite maltose utilizer gene) the petite cells derived from strains carrying the constitutive MAL4 gene

are unable to utilize maltose (Khan, 1982). These cells also lose the ability to synthesize maltase. However, in the respiratory proficient state the nuclear gene PMU-1 is not required for maltase synthesis. These observations strongly support the idea that the mitochondrial genome must carry a gene similar in function to the nuclear PMU-1 gene. In order to resolve this question we have isolated petite mutants from strains carrying the recessive pmu gene, using manganese chloride as a mutagen. Since manganese chloride induces point mutations and small deletions in mitochondrial DNA, the petite mutants were tested for revertants on glycerol and maltose plates. Among the petites we have tested we find some of them revert on glycerol plates. The clones which revert on glycerol plates, concomitantly revert on maltose plates. This relationship between the rho+ phenotype and maltose utilization in the absence of the nuclear PMU-1 gene, strongly supports our idea that there is a mitochondrial gene product which affects maltose utilization in yeast. Homologous DNA sequences in nuclear and mitochondrial genomes are known to exist in yeast (Farrelly and Butow, 1983). In Neurospora a similar situation exists, where it has been shown that there are two similar gene sequences, one in the nuclear genome, and another in mitochondrial DNA coding for a subunit of the enzyme ATPase (Boogaart et al., 1982). Significance of these results will be discussed.

This work was supported by a grant No. 14072 from the city University of New York Faculty Research Award program.

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XV. Department of Biophysics, National Institute of Mental Health and Neuro Sciences, Bangalore 560 027, India. Communicated by V.K. Jain.

One of our papers has recently been published in Radiation Research. An abstract of this is as follows:

Jain, V.K., Gupta, I. and Lata, K. Energetics of Cellular Repair Processes in a Respiratory-Deficient Mutant of Yeast. Radiat. Res. 92, 463-473 (1982).

Repair of potentially lethal damage induced by cytotoxic agents like UV irradiation (254 nm), psoralen-plus-UVA (365 nm), and methyl methanesulfonate has been studied in the presence of a glucose analog, 2-deoxy-D-glucose, in yeast cells. Simultaneously, effects of 2-deoxy-D-glucose were also investigated on parameters of energy metabolism like glucose utilization, rate of ATP production, and ATP content of cells. The following results were obtained. (i) 2-Deoxy-D-Glucose is able to inhibit repair of potentially lethal damage induced by all the cytotoxic agents tested. The 2-deoxy-D-glucose induced inhibition of repair depends upon the type of lesion and the pattern of cellular energy metabolism, the inhibition being greater in respiratory-deficient mutants than in the wild type. (ii) A continuous energy flow is necessary for repair of potentially lethal damage in yeast cells. Energy may be supplied by the glycolytic and/or the respiratory pathway; respiratory metabolism is not essential for this purpose. (iii) The magnittude of repair correlates with the rate of ATP production in a sigmoid manner.

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XVI. Kyoto University, The Research Institute for Food Science, Uji, Kyoto, Japan 611. Communicated by Akira Kimura.

We have recently completed a new method for yeast transformation. Preparation of protoplasts has been an indispensable process for yeast transformation. However, we have succeeded in the introduction of DNA into intact cells treated with alkali cations or thiol compounds. The method was published in J. Bacteriol. 153, 163 (1983) (see abstract below) and further information will be published in Agric. Biol. Chem. (in press) (1983).

Hisao Ito, Yasuki Fukuda, Kousaku Murata and Akira Kimura (1983), Transformation of Intact Yeast Cells Treated with Alkali Cations, Journal of Bacteriology 153:163-168

Intact yeast cells treated with alkali cations took up plasmid DNA. Li^+, CS^+, Rb^+, K^+, and Na^+ were effective in inducing competence. Conditions for the transformation of Saccharomyces cerevisiae D13-1A with plasmid YRp7 were studied in detail with CsCl. The optimum incubation time was 1 h, and the optimum cell concentration was 5×10^7 cells per ml. The optimum concentration of Cs^+ was 1.0 M. Transformation efficiency increased with increasing concentrations of plasmid DNA. Polyethylene glycol was absolutely required. Heat pulse and various polyamines or basic proteins stimulated the uptake of plasmid DNA. Besides circular DNA, linear plasmid DNA was also taken up by Cs^+-treated yeast cells, although the uptake efficiency was considerably reduced. The transformation efficiency with Cs^+ or Li^+ was comparable with that of conventional protoplast methods for a plasmid containing ars1, although not for plasmids containing a 2μm origin replication.

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XVII. Carlsberg Laboratory, Department of Physiology, GL. Carlsberg Vej 10, DK-2500 Copenhagen Valby, Denmark. Communicated by Morten C. Kielland-Brandt.

Jens G. Litske Petersen, Morten C. Kielland-Brandt, Steen Holmberg and Torsten Nilsson-Tillgren[1] (1983). Mutational Analysis of Isoleucine-Valine Biosynthesis in Saccharomyces cerevisiae. Mapping of ilv21 and ilv5. Carlsberg Res. Commun. 48:21-34.

[1]Institute of Genetics, University of Copenhagen, Oster Farimagsgade 2A, DK-1353 Copenhagen K.

Fifty-five isoleucine-valine requiring mutants were selected in a haploid strain of Saccharomyces cerevisiae after treatment with ethyl methanesulfonate. All the mutants could be assigned to the known complementation groups, ilv1 (threonine deaminase), ilv2 (acetohydroxyacid synthetase), ilv5 (acetohydroxyacid reductoisomerase) and ilv3 (dihydroxyacid dehydrase). Intragenic complementation occurs in both ilv2 and ilv5. The levels of α-acetohydroxyacids formed by these four types of mutants were consistent with the previous notion that the mutants define the structural genes coding for these enzymes.

Chromosome assignment by the Rec^- (spo11) mapping method showed that ilv2 was located on chromosome XIII, and ilv5 on chromosome XII. The locations were confirmed by mitotic analyses, using either rad52 homozygosis or benzimidazol carbamic acid methyl ester. Tetrad analysis placed ilv2 on the right arm of chromosome XIII, 36 cM distal to lys7, and ilv5 was

positioned on the right arm of chromosome XII, distal to the ribosomal RNA gene cluster (rDNA) and proximal to ura4.

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XVIII. Department of Molecular Genetics, Institute of Molecular Biology, Bulgarian Academy of Sciences, Sofia 1113, Bulgaria. Communicated by P.V. Venkov.

Below follows the abstract of a recent publication which appeared in Cell, 33, 221-230, May 1983. Liliana Waltschewa, Oleg Georgiev and Pencho Venkov.

Relaxed Mutant of Saccharomyces cerevisiae: Proper Maturation of Ribosomal RNA in Absence of Protein Synthesis

Summary

We present here the characterization of the first relaxed yeast mutant - Saccharomyces cerevisiae SY15, isolated by mutagenesis with ethylmethane sulfonate of strain A364A. Starvation for a required amino acid, or treatment with cycloheximide blocked protein synthesis in both, parental and mutant strains, while the synthesis of total RNA is inhibited by 72% in A364A and 23% in SY15 cells. In the absence of protein synthesis the transcription of 37S primary precursor to rRNA is not inhibited in the SY15 mutant, while in the parental A364A strain it is strongly inhibited and is only 15% of the control. Since the inhibition of rRNA transcription was shown to be the primary target of the stringent control in yeast (Shulman, Conjeevaram, Sripati and Warner, 1977) the lack of such inhibition characterizes the SY15 as a relaxed mutant of Saccharomyces cerevisiae. The SY15 relaxed yeast mutant is substantially different from those of E. coli in several aspects: 1. In the complete absence of protein synthesis the rRNA transcripts are fully processed although at a reduced rate. Determination of the 5'- and 3'-termini of rRNA made in absence of protein sythesis suggests a correct cleavage into 25S and 18S rRNA molecules. 2. The processed rRNA molecules are nearly, or perhaps completely nude in absence of protein synthesis. Centrifugations in low and high salt sucrose gradients and im metrizamide density gradients supplied evidence that in SY15 cells starved for a required amino acid, or treated with cycloheximide rRNA molecules exist almost free of ribosomal proteins. The results obtained suggest that the change to relaxed phenotype in yeast is accompanied by alteration in the regulation of rRNA biosynthesis at transcriptional and post-transcriptional levels.

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XIX. Alko, Box 350, SF-00101 Helsinki 10, Finland. Communicated by Heikki Suomalainen.

Below follows a list of our work published since December 1982.

1. Erkki Oura (1983). Biomass from Carbohydrates. Biotechnology, vol. 3. Biomass Microorganisms for Special Applications, Microbial Products I. Energy from Renewable Resources. (H. Dellweg, ed.), pp. 3-41, Verlag Chemie, Weinheim.

In the first part of the review important theoretical considerations are outlined concentrating on the metabolic stoichiometry and especially energetics of yeast growth. Computations representing the formation of yeast cell material from glucose are given. Also a table comparing the *in vitro* and *in vivo* activities of some key metabolic enzymes of yeast should be very useful for biochemists as well as for yeast technologists. The second part of the article covers the current understanding of baker's yeast production with some emphasis also on wine and feed yeast production. Sulphite waste liquor, whey and starch are the raw materials which present special problems for biomass production. These aspects are covered in the final section of the review.

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2. John Londesborough and Kari Suoranta (1983). The Zinc-Containing High K_m Cyclic Nucleotide Phosphodiesterase of Bakers' Yeast. J. Biol. Chem. 258: 2966-2972.

The high K_m cyclic nucleotide phosphodiesterase of *Saccharomyces cerevisiae* was purified by an improved procedure. Its amino acid composition is reported. Its pI is 5.85 ± 0.1. Sedimentation equilibrium analysis of the native enzyme gave M_r = 88,000 ± 6,000, whilst gel electrophoresis in the presence of dodecyl sulfate gave a molecular weight of 43,000, suggesting that the enzyme is a dimer. Preparations of 94 ± 4% purity contained about 2.4 atoms of zinc/43,000 daltons. Inactivation of the enzyme by 8-hydroxyquinoline was accompanied by removal of about 2 zinc atoms per monomer. Partially inactivated enzyme regained activity during dialysis against zinc, or with less effect, cobalt salts. 8-Hydroxyquinoline (K_i = 1.1 mM) and 1,10-phenanthroline (K_i = 0.6 mM) were competitive inhibitors. The enzyme was also inhibited by the nonchelating 1,7- and 4,7-phenanthrolines and by thiols and KCN, but not by NaN_3. These inhibitors probably act by binding to, but not chelating, enzyme-bound zinc.

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3. Lalli Nykanen and Heikki Suomalainen (1983). Aroma of Beer, Wine and Distilled Alcoholic Beverages. Handbuch der Aromaforschung. (Manfred Rothe, ed.), 413 pp., Akademie-Verlag, Berlin and D. Reidel Publishing Company, Dordrecht-Boston-London.

Biochemical processes which are of importance in the formation of carbonyl compounds, fusel alcohols, fatty acids, esters of fatty acids and sulphur compounds during fermentation by yeast are discussed in the book on pages 3-17, followed by a detailed account of the qualitative and quantitative composition of the aroma of beer, wine and distilled alcoholic beverages (pages 18-322). The determination and occurrence of the compounds in each homologous group are dealt with in separate chapters. The monograph includes more than 1300 aroma compounds, the identity of which has been confirmed by chromatographic and spectrometric methods, and frequently by mass spectrometry as well. A chapter on sensory methods by Paula Jounela-Eriksson has been included at the end of the monograph. The book contains 32 figures. A large amount of the qualitative and quantitative information bearing upon the aroma in beer, wine and distilled alcoholic beverages has been summarised in 173 tables. In collecting information for this book emphasis has been placed on publications appearing after 1965. The bibliography was completed at the end of 1980. Some 1400 publications have been referred to.

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4. K. Edelmann and P. Stelwagen (1983). Reduction of the Wastewater Load in Yeast Production. 8th International Specialized Symposium on Yeasts (VIII ISSY), January 24-28, 1983, Bombay, India.

Abstract

The organic load of spent wash from a baker's yeast plant is usually 250-300 kg BOD_7/ton yeast d.m. when the conventional carbon source, molasses, is used. Although molasses contains vital nutrients for yeast besides assimilable sugars, it also contains matters not assimilable by Saccharomyces cerevisiae, e.g., betaine in beet molasses. To improve the total economy of yeast production we have searched for alternative carbon sources causing less pollution. An enzymatically hydrolyzed grain starch syrup and chromatographically de-betainized beet molasses have been tested in propagations. The former contained 5% glucose, 15% maltose, 16% maltotriose and 62% of oligosaccharides. During the otherwise normal propagation amyloglucosidase was added to hydrolyze the oligosacchrides into assimilable sugars. The yield was 42 g yeast d.m./100 g of sugar as glucose. The organic load of spent wash was 160 kg BOD_7/ton yeast d.m. In de-betainized molasses all original sugars were unchanged but the removal of betaine caused an increase of the purity quotient from 65% to 80%. When used mixed with the original molasses at 0, 25, 50 and 100%, the organic loads of spent wash were, respectively, 250, 220, 180 and 120 kg BOD_7/ton of yeast d.m. Processing lines for these two alternative raw materials can be attached directly to the yeast propagation equipment. Expensive intermediate evaporation of resulting sugar solutions can thus be avoided.

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5. Matti Korhola (1983). Improvement of Ethanol Tolerance in Saccharomyces cerevisiae. 8th International Specialized Symposium on Yeasts (VIII ISSY), January 24-28, 1983, Bombay, India.

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The following publications have been published since the last communications. The abstracts of reports have been given in Yeast Newsletter 31(1982): 2, 82-83.

M. Korhola, E. Oura and H. Suomalainen. Glucose/Molasses effects on enzyme activities and fermentative activity of fully aerobic continuous cultures of baker's yeast. Folia Microbiologica 27:308-315 (1982).

K Edelmann and L. Penttila. Amylases in yeast production, Utilisation des Enzymes en Technologie Alimentaire - Use of Enzymes in Food Technology, (P. Dupuy, ed.), Technique et Documentation, Lavoisier, Paris, 1982, pp. 83-87.

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XX. Department of Applied Microbiology and Food Science, University of Saskatchewan, Saskatoon, Canada S7N OWO. Communicated by W.M. (Mike) Ingledew.

The following papers have been published or are in press.

M.D. Dhawale, J.J. Wilson, G.G. Khachatourians, W.M. Ingledew (1982). Improved Method for Detection of Starch Hydrolysis. Appl. Environ. Microbiol. 44(3):747-750.

Abstract

A new starch hydrolysis detection method which does not rely on iodine staining or the use of color-complexed starch is described. A linear relationship was obtained with agar-starch plates when net clearing zones around colonies of yeasts were plotted against enzyme levels (semilogarithm scale) produced by the same yeast strains in liquid medium. A similar relationship between starch clearing zones and α-amylase levels from three different sources was observed. These observations suggest that the method is useful in mutant isolations, strain improvements programs and the prediction of α-amylase activities in culture filtrates or column effluents.

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M.D. Dhawale and W.M. Ingledew (1983). Starch Hydrolysis by Derepressed Mutants of Schwanniomyces castellii. Biotech. Letters. 5(3):185-190.

Abstract

2-Deoxyglucose resistant mutants of Schwanniomyces castellii display a range of derepression for both α-amylase and glucoamylase. The least affected by increased starch, mutant R69, produced 3 to 4-fold levels of α-amylase and glucoamylase, but was still unable to completely hydrolyze cooked wheat-starch. This insufficiency was overcome by simultaneous hydrolysis and fermentation.

* * *

C.P. Casey, C.A. Hass, D.W. Hysert, W.M. Ingledew (1983). Effective Transportation of Brewer's Yeast Slurry. J. Institute Brewing 89: (in press).

Abstract

A yeast shipment method suitable (depending on vessel size) for 1 to 20 liters of slurried yeast is described. The method was investigated primarily assuming transit (storage) temperature at approximately 21°C. Under these conditions, the contained yeast was stable over 116 hours at temperatures well under 16°C, and maintained its viability, fermentability and vigor to reinitiate new fermentations. under more rigorous climatic conditions, shipment time would have to be reduced, but adequate protection time was afforded for all but the most extreme sub-zero situation.

* * *

XXI. Research Institute for Viticulture and Enology, 833 11 Bratislava, Matuskova 25, Czechoslovakia. Communicated by E. Minarik.

The following papers have been submitted or have been accepted for publication:

E. Minarik: Activation of alcoholic fermentation of musts with high sugar content (in German) Mitteilungen Klosterneuburg (Austria) 33, 1983 (in press).

Summary

The fermentation of musts with high sugar content could be positively influenced by various activators. A particularly effective intensification of the fermentation was achieved by the activator Botrytis cinerea. The alcohol content of the wines was increased and the volatile acid level substantially reduced. Thiamin had only little influence, and ammonium phosphate did not show any stimulating effect on the fermentation.

* * *

E. Minarik, Z. Silharova, O. Jungova: Contaminating yeasts of barrel and bottled wines of South Moravia (in German). Wein-Wissenschaft (GFR) 38, 1983 (in press).

Summary

The yeast flora of young barrel and aged bottled wines originating from South Moravia (Czechoslovakia) was investigated. Saccharomyces oviformis, a yeast species responsible for after-fermentation of sweet table wines, accompanied by film-forming yeasts of the genus Candida, predominate in young wines after first and second racking. In young and aged bottled wines the osmotolerant and fructophilic yeast S. bailii var. bailii predominates quite definitely. This yeast species is accompanied by S. cerevisiae and Torulopsis sp. The high frequency of S. bailii var. bailii in bottled wines should be understood as an important indication for effective preventive measures which should be seized in wine bottling.

* * *

E. Minarik: Possibilities of applying mixed and associated wine yeasts in wine making (in Slovak). Vinohrad (Bratislava) 21, 1983, 113-115.

Summary

The level of volatile acids in wines may be decreased when using mixed or associated wine yeasts Saccharomyces cerevisiae - Torulaspora rosei or S. oviformis - T. rosei. In order to obtain also high alcohol contents in the wine the ratio of T. rosei: S. cerevisiae or T. rosei: S. oviformis should be 9:1. Practical technological aspects concerning Tokay wines are briefly discussed.

* * *

XXII. H.A.U. Hissar, COBSH, Haryana, India. Communicated by D.S. Dahiya.

Below follow several abstracts of our technological studies of yeast.

Ethanol Fermentation

1. Dhamija, S.S., Dahiya, D.S., Bardiya, M.C. and Tauro, P. Ethanol from

unclarified cane molasses: I. Recycling of yeast using centrifugation. Int. Sugar J. 39-41, Feb, 1982.

Summary

Laboratory scale studies indicated that the pretreatment steps of Melle-Boinot process of yeast recycling in molasses can be bypassed using unclarified molasses and without activation treatment of yeast. Fermentation time could be as short as 12 h by recycling the yeast recovered from 75% of wash. The fermentation efficiencies were as high as 91-93% in all of the six cycles tested.

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2. Dhamija, S.S., Dahiya, D.S. and Bardiya, M.C. (1980). Yeast screening and fermentation studies on beet molasses, Proc. 44th S.T.A. India, G.65.

Summary

For selecting a suitable yeast strain for beet molasses fermentation, 30 yeast strains obtained from different parts of the world were tested under laboratory conditions. Out of these, three strains were found to ferment beet molasses fastest. While comparing their rate of fermentation with that of cane molasses, the fermentation of beet molasses was found to be slower and this was mainly because of slow rate of yeast multiplication in this molasses.

* * *

3. Yadav, B.S., Dahiya, D.S. and Tauro, P. (1981). Screening of yeasts for fermentation of sugarcane juice and sugarcane (Preliminary Report), Proc. 45th Ann. Conv. Sugar Tech. Assoc. India.

Summary

From a screening study involving a large number of yeast strains for direct fermentation of sugarcane juice, strain 39 of Saccharomyces cerevisiae which can effectively ferment sugarcane juice to ethanol was obtained. Initial conditions for the fermentation of juice using this strain have been standardized and about 9% alcohol can be produced in 36 h. This strain has also been tested for fermenting sugarcane directly.

4. Dahiya, D.S., Koshy, M., Dhamija, S.S., Yadav, B.S. and Tauro, P. (1982). Spent Wash Recycling for Molasses Fermenation, Int. Sugar J. 84, No. 1004.

Summary

Use of distillery spent wash as a diluent in molasses fermentation has been studied. The screening studies with different yeast strains revealed that strain 21 is capable of fermenting spent wash-diluted molasses solutions without any nutrient supplementation. Increasing concentration of spent-wash in the fermentation medium, however, decreased the rate of fementation and the fermentation efficiency. It was further noted that the cell sedimentation rate decreases with increasing concentratin of spent wash in the medium.

* * *

5. Yadav, B.S., Dahiya, D.S. and Tauro, P. (1982). Studies on Fermentation of Sugarcane Juice for the Production of Ethanol, Proc. Ann. Conv. Sugar Tech. Assoc. India.

Mixed juice from sugar mills had sugar levels between 12 and 13% while the total reducing sugars in the juice obtained from HAU Farm was 18.7%.

The rate of fermentation and alcohol production was found higher when the mixed juice from Mills was used as fermentation raw material than when diluted juice from HAU Farm was used. It was further observed that there is no effect of clarification of mixed juice before fermentation on the alcohol production. Addition of 200 ppm urea resulted in higher alcohol production and higher levels of urea (400-1000 ppm) in the fermentation medium reduced the fermentation time and increased the alcohol production as well ultimately.

The optimum fermentation temperature of strain No. 39 was found to be around 35°C for efficient fermentation of cane juice. The fermentation time has been reduced to 18 h by re-use of yeast sludge and an increase in alcohol production was also observed.

* * *

Our current research interests are centered in the following areas:

1. Kinetics of unclarified molasses fermentation by S. cerevisiae.
2. Use of spent wash (effluent) as mash water in cane molasses fermentation - a method to control pollution.
3. Improvement of distiller's yeast through genetic manipulations.
4. Direct utilization of excess sugarcane/cane juice through fermentation for production of biofuel.

* * *

XXIII. Biotechnology Department, Kuwait Institute for Scientific Research, Kuwait (KISR) Safat, P.O. Box 24885. Communicated by Amin S. El Nawawy.

I have moved from Alfateh University, Tripoli, Libya to the above Institute where I intend to stay until July 1984. Below follows an abstract of work done in Tripoli, which was presented at the XIIIth Intern. Congress of Microbiology in Boston, Aug. 1982.

New Yeast Isolates from Natural Sources in Libya

Amin S. El Nawawy, Said O. Gnan, Faculty of Agriculture, Alfateh University, Tripoli, Libya (Splaj).

Ten strains of yeast were isolated from some natural sources available in Libya, i.e., soil, date syrup wastes, and citrus peel wastes. The ten

isolates were identified according to the scheme mentioned in 'The yeast' 1970. Four isolates belong to genus Candida, three to genus Hansenula, one to genus Rhodotorula, one to genus Cryptococcus, one to genus Saccharomyces. However, some of their physiological characteristics show some variations from the already known and described species and variants. Such differences are discussed.

One of the Hansenula isolates and Rhodotorula isolate proved to be efficient in utilizing methanol as sole carbon source. Eight other isolates range in their ability to utilize specific carbon sources, i.e., xylose, lactose, sucrose and starch; indicating possibility of each strain for utilizing specific raw materials, i.e., methanol, date syrup wastes, starchy wastes and wood shavings hydrolyzate. Nucleic acid contents of the isolates vary in the range of 2.5-6.5 percent.

* * *

XXIV. Retirements

1. After nearly 40 years of work in teaching and research, with 4 intervening years as a foot-soldier in combat line, I have retired from active service in this National University and have left my duties here on the 1st of April, 1983.

   On this occasion, I wish to express my sincerest thanks to my colleagues around the world for generous acceptance into international community, helpful support, and personal friendship during these four decades.

   Even without my presence, Japan still has a growing potential and a wealth of competent investigators in this field of biological study. I shall be glad to help you in promoting scientific and cultural exchanges between your country and Japan in future years.

   I wish you good health, successful work, and that life in peace will return for the years to come.

   Susumu Nagai

   P.S. I can be reached at either of the following addresses:

Home	University
Mezon Kotari 6-204 Ichirizuka 2 Nagaokakyo Kyoto 617 Japan	Professor Emeritus Nara Joshi Daigaku Nara 630 Japan

2. Two prominent Finnish scientists in the field of yeast research retired in 1982. Professor Heikki Suomalainen and Dr. Erkki Oura, both of the Finnish State Alcohol Monopoly, are well-known to all yeast scientists. Their publications are numerous and so are the friends they made at various congresses and yeast meetings.

   Professor Heikki Suomalainen joined the State Alcohol Monopoly as a research biochemist in 1941; he was appointed head of the laboratory in 1951 and director of industrial production and research in 1958.

Professor Suomalainen was active in many scientific societies and international bodies. He was a member of the Fermentation Industries Section of IUPAC for many years and its chairman 1965-1969. He was also a member of the Applied Chemistry Division of IUPAC and its president 1977-1981.

The research work of Professor Suomalainen was voluminous. He published over 300 articles mainly on yeast and many of them in collaboration with Dr. Oura. His studies were concerned with different aspects of the structure and function of the yeast cell, particularly with fermentability of various sugars and the enzymes involved, permeability of yeast cells, the role of biotin in yeast growth, formation of diacetyl and other flavour compounds, flavour of alcoholic beverages as well as composition of yeast cell wall and plasma membrane. His activities, of course, encompassed also applied research in connection with the production of alcoholic beverages, baker's yeast and vinegar.

Dr. Erkki Oura also spent his whole scientifically active period with the State Alcohol Monopoly. He joined Professor Suomalainen's research team in 1954 and was appointed head of fermentation research in 1971. Dr. Oura participated in many international congresses as invited lecturer and organized under the chairmanship of Professor Suomalainen the Third International Specialized Symposium on Yeasts (Helsinki, 1973) and the EUCHEM Conference on Metabolic Reactions in the Yeast Cell under Anaerobic and Aerobic Conditions (Helsinki, 1977).

Dr. Oura's research work concentrated on yeast and of his 130 publications less than 10 are concerned with other subjects. in his studies, the cultivation of yeast and the influence of different factors on growth were central questions. Energetics of yeast, the role of enzymes, decarboxylations, permeability of the cell membrane as well as the role of oxygen and vitamins were some of many topics studied by Dr. Oura

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* * *

XXV. Books

1. School of Biological Sciences, University of East Anglia, Norwich NR4 7TJ, England. Communicated by James A. Barnett.

Announcing

Yeasts: Characteristics and Identification

J.A. Barnett, D. Yarrow and R.W. Payne

About 800 pages, nearly 500 photomicrographs. About £65

Cambridge University Press. Publication summer 1983

A book for facilitating the use of yeasts in industry and the laboratory and making identification of yeasts easier. The most complete survey of the yeasts ever published or likely to be published for several years.

Each of about 470 species, examined at the Yeast Division of the Centraalbureau voor Schimmelcultures and the John Innes Institute, is photomicrographed and described for its appearance, modes of reproduction and responses to 83 tests. Tests include semi-anaerobic fermentation of 13 carbohydrates, aerobic utilization of 47 compounds, vitamin requirements and responses to cycloheximide.

Both generic and specific characteristics are tabulated. There are 18 identification keys, including keys for clinical yeasts, yeasts associated with food, soft drinks, beer, wine, and yeasts using methanol or hydrocarbons. There are tables of minimal numbers of tests for confirming the identity of each species. A register of about 3,500 yeast names includes references and, where known, the current name of each yeast. An alphabetic register of specific epithets gives the genera to which they have belonged. A chapter explains how to identify yeasts; there is a glossary, a bibliography of about 1500 references and a general index.

The book has been prepared and typeset by the latest computer methods and so is able to include information about recently described species.

* * *

2. N.J.W. Kreger-van Rij, editor of the third edition of The Yeasts - a taxonomic Study, writes that the new edition of this classical work has gone to press (North Holland Publishing Co., Amsterdam). It is hoped that this latest edition will be available in late 1983 or early 1984. The first edition (by J. Lodder and N.J.W. Kreger-van Rij) appeared in 1952 and the second edition (J. Lodder, editor) in 1970.

* * *

XXVI. Meetings

1. Workshop on "Membrane Transport in Yeasts"

An international intensive workshop on "Membrane Transport in Yeasts" will be held in the Gulbenkian Institute of Science, Oeiras, Portugal from May 28-June 8, 1984. The principal lecturers are Prof. Vincent Cirillo (Stony Brook, N.Y.), Prof. A.A. Eddy (Manchester, U.K.), Dr. Arnost Kotyk (Prague) and Dr. Ramon Serrano (Madrid). Participants may be accepted from any part of the world, should have previous experience in membrane and/or transport work and are expected to contribute a seminar paper to the workshop.

Requests for information should be directed to:

Prof. N. van Uden
Laboratory of Microbiology
Gulbenkian Institute of Science
2781 Oeiras Codex
Portugal

* * *

2. VIIth International Biotechnology Symposium, New Delhi, India, February 19-25, 1984.

For further information write to:

Prof. T.K. Ghose, Chairman
National Organising Committee
VIIth International Biotechnology Symposium
Biochemical Engineering Research Centre
Indian Institute of Technology
Hauz Khas
New Delhi 110 016, India

* * *

3. VIth International Symposium on Yeast, July 9-13, 1984. Montpellier - France (see Yeast Newsletter, December 1982).

Scientific Secretriat
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34006 Montpellier Cedex - France
Tel (67) 92.42.72

* * *

4. Below follows a report from the IXth International specialized symposium (IXth ISSY), held in Smolenice, Czechoslovakia, 18-22 April, 1983.

The Symposium was very successful, weather wonderful including the excursion to a new plant for wine production and production of non-alcoholic beverages in Pezinok, and sightseeing of Bratislava. There were 105 participants (51 from abroad and 54 local). The pleasant atmosphere of the Smolenice castle contributed greatly.

A. Kocková-Kratochvílová
Institute of Chemistry
Slovak Academy of Sciences
Dubravska cesta,
842 38 Bratislava
Czechoslovakia

Plenary lectures:

E.K. Novák (Hungary): Hygienic zymology

G.S. de Hoog (The Netherlands): Taxonomy of yeast-like anamorphic fungi

Y. Koch (GDR): Yeast isolations and their interpretation

Session 1.

O. Ramirez, A. Gonzales (Spain): New species of yeasts isolated from Chilian "pale podrido" in the rainy valdivian forest

A. Kocková-Kratochvílová, R. Contreras (CRRS, Cuba): Yeast-like organisms isolated from plant material of Cuba

V. Stollárová (CSSR): The presence of Hanseniaspora uvarum in natural populations of yeasts

A. Kocková-Kratochvílová, E. Slávíková, E. Breierová (CSSR): Yeasts isolated from the surface of species of agarics of the Lowland of Zahorie

Session 2.

E. Minárik (CSSR): Mixed and associated yeast cultures and their influence on the fermentation of must

G. Rosini (Italy): The origin of Saccharomyces cerevisiae in winemaking

R. Contreras, I. Valdes (Cuba): Yeast selection for human consumption

Č. Novotný, A. Pichová, L. Vlasáková, J. Zajíček, K. Beran (CSSR): Physiological aspects of sterol synthesis in Saccharomyces cerevisiae.

L. Kuniak, J. Zemek, B. Kadlečíková (CSSR): Immobilization of Wingea robertsii whole cells in crosslinked polyethylenimine.

N. Neujahr (Sweden): The effect of phenols on Trichosporon cutaneum and Candida tropicalis

Poster session 1:

C. Dobolyi, M. Csanády, E.K. Novák (Hungary): Yeasts in fresh and wastewaters

C. Dobolyi, L. Berky, I. Várkonyi, E.K. Novák (Hungary): Yeasts in air of agricultural areas

J. Bacílek, L. Šilhánková (CSSR): Effect of the pesticide folpet on the occurrence of yeasts in the digestive tract of the Honeybee (Apis mellifera)

M. Javorková, B. Janderová, O. Bendová (CSSR): Yeast-like microorganisms on leaves of tree species in Prague

L. Švorcová (CSSR): Occurrence of yeasts in swimming pools and bath waters

Z. Jesenská (CSSR): Yeasts in Bratislava's surface waters

I. Zvyagintseva (USSR): The peculiarities of lipid metabolisms in yeasts from different habitats

T. Tőrők (Hungary): Thermal inactivation of yeasts

O. Ilnicka-Olejniszak (Poland): Effect of yeasts on the biotechnological properties of baker's yeasts

H. Oberman, H. Stobińska (Poland): Occurrence of yeasts in starches produced commercially

T. Deák (Hungary): Factors influencing the microbiological stability of bottled wines

G. Basařová, J. Vernerová (CSSR): Sulphur dioxide formation by yeast in brewery fermentation

A. Halász, A. Muayad et al. (Hungary): The effect of aeration intensity on methionine-rich yeast strains

A. Muayad, B. Mátrai, A. Halász (Hungary): Lipoic acid and methionine content of yeasts

Session 3:

A. Kocková-Kratochvílová, E. Slávíková, S. Miertuš (CSSR): Modified procedure for the identification of 65 genera of yeasts and yeast-like organisms

E. Slávíková, A. Kocková-Kratochvílová (CSSR): Modified procedure for the identification of the genera Candida and Torulopsis

A.E. Vaughan, A. Martini (Italy): Deoxyribonucleic acid relatedness among species of the yeast genus Cryptococcus

Session 4:

A. Tomšíková (CSSR): Yeasts in men and their environment and their relation to diseases

P. Krogh, P. Holmstrup, P. Vedtofte, J.J. Pindborg (Denmark): A study of the yeast flora in human oral leukoplakia: preliminary results

J. Zemek, J. Augustin, B. Kadlečiková, A. Kocková-Kratochvílová: Production of hydrolytic enzymes by yeasts and yeast-like organisms in relation to their pathogenicity

C. Pascual, L. Herrera (Cuba): Glycolytic mutants and catabolite inactivation in Saccharomyces cerevisiae

J.F.T. Spencer (England): Fusion of protoplasts of Candida albicans and of a petite mutant of Saccharomyces diastaticus

Poster session 2:

W.I. Golubev (USSR): Taxonomic examination of yeast genus Nadsonia Sydow. I. Morphological and physiological characterization

R. Montrocher, M.L. Claisse (France): Cytochrome spectra in the yeast genus Candida

A. Kocková-Kratochvílová, L. Hronská (CSSR): The cytochromes in yeasts

J.S. Fiol (France): Biosystematics of yeasts: application in the genus Kluyveromyces van der Walt

A. Nowakowska-Waszczuk, M. Pietka (Poland): A new yeast producing chlamydospores

D. Gášková, J. Plášek, V. Vondrejs (CSSR): A rapid assay of killer-sensitive strains in yeasts

O. Bendová, J. Vernerová, L. Kupcová et al. (CSSR): Characterization of a hybrid clone of brewer's yeast producing a killer factor

J. Zala, I. Vincze, E.K. Novák (Hungary): Effect of polyenes on pathogenic yeasts

M. Valášková, L. Masler, J. Šandula (CSSR): Comparative structural and immunological studies of capsular polysaccharides of Cryptococcus species

J. Šandula, L. Masler, P. Kočiš (CSSR): Comparative structural and immunological studies of mannans of pathogenic Candida species

Z. Gonzales-Lama, A.M. Lamas, R.H. Lopez-orge (Spain): A preliminary study of superoxide dismutase in Candida albicans

H. Weber, G. Barth, C. Kurischko (GDR): mating and sporulation in the yeast Saccharomycopsis lipolytica

C. Kurischko (GDR): Analysis of genetic markers in new breeding stocks of Saccharomycopsis lipolytica

A. Maráz (Hungary): Production of vegetative hybrids of Saccharomyces cerevisiae and Torulopsis glabrata by protoplast fusion

L. Šilhánková, M. Juřiček, F. Šmíd et al. (CSSR): Mutagenic effect of 1,3-dichloro-2-propanol in Saccharomyces cerevisiae

G. Straube (GDR): Degradation of phenol and chlorophenols by Candida utilis

U. Klimer (GDR): Genetical studies on yeast populations

Session 5:

H. Weide, H.H. Krauel, U. Krauel (GDR): Sequence in mixed substrates catabolism by yeasts

P. Biely, E. Petráková (CSSR): Specificity of induction of the xylan-degrading enzyme system in Cryptococcus albidus

D. Vraná (CSSR): A new approach to the question of physiological state in budding yeast populations

J. Lieblová, P. Venkov (CSSR, Bulgaria): Maturation of RNA in mother and daughter cells of Saccharomyces cerevisiae fragile mutants

E. Streiblová, J. Hašek (CSSR): The cytoplasmic cytoskeleton in cdc mutants of yeasts

Poster session 3:

A. Svoboda, A. Trujillo-González (CSSR, Mexico): Freeze-etch study of Sporothrix schenckii

A. Sládečková, O. Nečas, T. Kuncová (CSSR): Influence of ethylene glycol on yeast cell ultrastructure

M. Gabriel, M. Kopecká (CSSR): Cell wall regeneration and reversion in protoplasts of the fission yeast, Schizosaccharomyces versatilis

M. Kopecká (CSSR): The effect of papulacandin B on cells and regenerating protoplasts of Saccharomyces cerevisiae

M. Th. Smith, N. Batenburg, V.D. Vegte (The Netherlands): Ascospore morphology and ultrastructure in the genus Lipomyces

V. Farkaš (CSSR): Selective radioactive labelling of cell wall polysaccharides in regenerating yeast protoplasts

F.H. Jacob, S. Poncet (France): Ethanol fermentation by inulin yeasts

P. Biely, A. Vancová (CSSR): Relationship between formation of three inducible enzymes of the xylan-degrading system of Cryptococcus albidus

H. Hrmová, M. Vršanská, P. Biely, E. Petráková (CSSR): Specificity of induction of cellulose and xylan-degrading enzymes in the yeast Trichosporon cutaneum

The following recommendations arose from the IX. ISSY-1983:

- to organize specialized symposia with ecological-taxonomical emphasis at regular intervals (e.g., every 5 years),
- to map out all known yeast habitats on the world map and to fill in the unexplored places systematically,
- from the view-point of medicine and hygiene, to consider yeast-like organisms, predominantly pathogenic, and Candida albicans as indicators of heavy water pollution,
- to establish a nomenclatural-taxonomic subcommission in ICY,
- to initiate collaboration among laboratories showing interest for checking identification procedures and the purity of chemical compounds used in these procedures,

- to use coding for important morphological and physiological features for the purpose of shortening strain characteristics in the list of collection strains.

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XXVII. Brief News Items

1. An international directory is being prepared to include as many investigators as possible who study yeast. The purpose of this project is to increase the ease with which these people can communicate with one another. If you wish to be included in this work, please provide the following information:

   Full name
   Complete mailing address
   Telephone number, including country and city code numbers.

   This information should be sent as soon as possible to:

   Dr. Terrance G. Cooper
   University of Pittsburgh
   Department of Biological Sciences
   247 Crawford Hall
   Pittsburgh, Pennsylvania 15260

2. The following publications have appeared recently:

   A. Touzi, J.P. Prebois, G. Moulin, F. Deschamps, P. Galzy. Production of food yeast from starchy substrates. Eur. J. Appl. Microbiol. Biotechnol. 15, 232-236, 1982.

   F. Martinet, A. Ba, R. Ratomahenina, J. Graille and P. Galzy. Utilisation des savons pour la production de levures-aliments. Oleagineux 37, n° 4, 193-198, 1982.

   B. Blondin, R. Ratomahenina, A. Arnaud and P. Galzy. A study of cellobiose fermentation by a Dekkera strain. Biotechnol. Bioeng. 24, 2031-2037, 1982.

   P. Galzy
   Chaire de Genetique et Microbiologie
   I.N.R.A. - E.N.S.A.
   Place Viala
   34060 Montpellier Cedex

3. Change of Address:

   I have recently accepted the position of Professor of Biophysics at the National Institute of Mental Health and Neuro Sciences, Hosur Road, Bangalore-560 029, India and have moved from the All India Institute of Medical Sciences, New Delhi.

   Viney K. Jain

4. Change of Address:

I shall be at Rockefeller University Hospital, 66th and York Ave., New York City, NY 10027, as of June 1, 1983, joining the "heme" research group of Dr. A. Kappas. My former address was Dept. of Biol. Sci., Barnard College, Columbia University, New York, NY.

Edith G. Gollub

5. Change of Address:

I have moved from Alfateh University, Faculty of Agriculture, Tripoli, Libya to Biotechnology Dept., Kuwait Institute for Scientific Research, Kuwait (KISR) Safat, P.O. Box 24885.

Amin El Nawawy

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