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Y E A S T

A Newsletter for Persons Interested in Yeast

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Herman J. Phaff
Editor

NOTICE TO OUR READERS

The office of the Editor has been informed that invoice payments for the Yeast Newsletter by subscribers in foreign countries are subject to high service charges by their banks if payment is made directly to the Yeast Newsletter, Dept. of Food Science & Technology, University of California, Davis.

We have explored with the University of California the possibility of direct transfer of the subscription fee on the bank account of the University of California. Unfortunately, this is not possible because of the large size of the University on nine campuses in the State of California with its numerous accounts. It is suggested that subscribers may wish to purchase dollars and pay cash in order to save the high service charge or use a postal money order.

H.J. Phaff
Editor

I. Centraalbureau voor Schimmelcultures, Yeast Division, Julianalaan 67a, 2628 BC DELFT (Netherlands). Communicated by M. Th. Smith.

1. The following is a list of recently acquired yeasts by C.B.S.

Apiotrichum futroensis Ramirez & Gonzalez, CBS 8163, T, ex rotting Laurelia sempervirens, C. Ramirez;

Apiotrichum nothofagi Ramirez & Gonzalez: CBS 8166, T, ex rotting Nothofagus obliqua, C. Ramirez;

Apiotrichum osvaldii Ramirez & Gonzalez: CBS 8165, T, ex rotting Nothofagus obliqua, C. Ramirez;

Candida albicans (Robin) Berkhout: CBS 8190 = ATCC 36232, assay of miconazole, ATCC;

Candida bacarum (Buhagiar) Meyer & Yarrow: CBS 7102, ex dolphin's skin, M. Luykx;

Candida buffonii (Ramirez) van Uden & Buckley: CBS 7150 = ATCC 18813, T, ex Boletus edulis var. albus (replaces CBS 2838);

Candida catenulata Diddens & Lodder: CBS 7135, ex soil, W. J. Middelhoven;

Candida coipomensis Ramirez & Gonzalez: CBS 8178, T, ex rotting Eucryphia cordifolia, C. Ramirez;

Candida llanquihuensis Ramirez & Gonzalez: CBS 8182, T, ex rotting Nothofagus obliqua, C. Ramirez;

Candida laureliae Ramirez & Gonzalez; CBS 8180, T, ex rotting Laurelia philippiana, C. Ramirez;

Candida milleri Yarrow: CBS 8195, ex sour dough, Finland, M-L, Suihko;

Candida osornensis Ramirez & Gonzalez: CBS 8181, T, ex rotting Nothofagus dombeyii, C. Ramirez;

Candida petrohuensis Ramirez & Gonzalez: CBS 8173, T, ex rotting Nothofagus dombeyii, C. Ramirez

Candida pilmaiquenensis Ramirez & Gonzalez: CBS 8176, T, ex rotting Nothofagus obliqua, C. Ramirez;

Candida raluensis Ramirez & Gonzalez: CBS 8179, T, ex rotting Laurelia sempervirens, C. Ramirez;

Candida rancensis Ramirez & Gonzalez: CBS 8174, T, ex rotting Laurelia sempervirens, C. Ramirez;

Candida rignihuensis Ramirez & Gonzalez: CBS 8177, T, ex rotting Laurelia philippiana, C. Ramirez;

Candida rugosa (Anderson) Diddens & Lodder; CBS 7138, ex soil, W. J. Middelhoven;

Candida sophiae-reginae Ramirez & Gonzalez: CBS 8175, T, ex rotting Laurelia sempervirens, C. Ramirez;

Candida sequanensis Saez & Rodrigues de Miranda; CBS 8118, T, ex oats, H. Saez;

Citeromyces matritensis Santa Maria: CBS 7151, ex sucrose soln., H. J. Heinz b.v.;

Cryptococcus laurentii (Kuff.) Skinner: CBS 7139, ex soil, W. J. Middelhoven;

Hormoascus platypodis (Baker & Kreger-van Rij) von Arx: CBS 7105, 7106, ex Platypus sp. in Nothofagus cunninghamii, Tasmania, G. S. de Hoog;

Kluyveromyces cellobiovorans: CBS 7153 = NRRL Y-12509, US Patent 4,472,501;

Leucosporidium scottii Fell et al: CBS 8162 (T, Apiotrichum eucryphiae Ramirez & Gonzalez), ex rotting Eucryphia cordifolia, C. Ramirez: CBS 8188, ex Ficus distichus, m.t. A3B1, R. C. Summerbell: CBS 8248 = 1FO 1521, 1FO;

Nematospora sinecauda Holley et al: CBS 8199, T, ex oriental mustard Brassica juncea, R. A. Holley;

Pichia scaptomyzae Ramirez & Gonzalez: CBS 8167, T, ex gut of Scaptomyza multispinosa, C. Ramirez;

Pichia stipitis Pignal: CBS 7124 = 1FO 1720, 7125 = 1FO 10006, 7126 = 1FO 10007, production of ethanol from xylose, Japanese Patent 152489/1983, M. R. Wijsman;

Rhodosporidium dacryoidum Fell et al: CBS 7142, ex sea, m.t. A2B2, J. W. Fell;

Rhodotorula mucilaginosa (Joergensen) Harrison: CBS 7117, albino strain, R. L. Blanton;

Saccharomyces cerevisiae Hansen: CBS 7146, ex culture contaminant, CBS;

Saccharomyces dairensis Naganishi: CBS 7127 = 1FO 10008, 7128 = 1FO 10009, ex soil, production of alcohol from ribose, Japanese Patent 152489/1983, M. R. Wijsman;

Schwanniomyces occidentalis Kloecker: CBS 8196, 8197, 8198, starch-utilizing mutants resistant to carbon catabolite repression (Current Genetics 8: 525-530, 1984), J. A. Barnett;

Trichosporon adeninovorans Middelhoven et al: CBS 8244, T, ex soil, W. J. Middelhoven;

Trichosporon beigelii (Kuechenm. & Rabenh.) Vuillemin: CBS 7137, 7138, ex soil, W. J. Middelhoven

Trichosporon loubieri: (Morenz) Weijman: CBS 7132, ex contaminant of culture of Entycoma ex leaf, G. S. de Hoog;

Yarrowia lipolytica (Wickerham et al.) van der Walt & von Arx: CBS 7133, ex skin infection of off-set printer operator, m.t. A, G. S. de Hoog;

2. Publications

1984

1. von Arx, J. A. & Yarrow,D., 1984. The adventures of the yeast genus Endomycopsis Dekker. Antonie van Leeuwenhoek 50:799-805.

Abstract

The yeast genera Endomyces, Endomycopsella, Guilliermondella and Saccharomycopsis are delimited by the size, structure and pigmentation of the ascospores; they include mycelial yeasts formerly classified in the invalid genus Endomycopsis. The ultrastructure of the cell wall and the septa of yeasts is briefly discussed.

2. de Hoog, G. S. & Smith, M.Th., 1984. Morphological taxonomy of little differentiated Hyphomycetes. Antonie van Leeuwenhoek 50:807-813.

Abstract

Morphological taxonomy of simple Hyphomycetes is complicated by the frequent occurrence of pleoanamorphism. In some groups of yeast-like fungi, uncommon synanamorphs are diagnostic. Differences in conidiogenesis do not always delimit natural groups. Some nomenclatural problems are mentioned, with an emphasis on the need of neotypification. Prospects are sketched for future taxonomic research.

3. Saez, H. & Rodrigues de Miranda, L., 1984. The Yeast Candida sequanensis sp. nov. Antonie van Leeuwenhoek 50:379-381.

Abstract

A strain of an undescribed Candida species was isolated from animal fodder. A description of the new species is given and its distinction from the most closely resembling species of the genus is discussed.

1985

4. Barnett, J. A., Payne, R.W. & Yarrow, D., 1985. Yeast Identification Program. Cambridge University Press Micro Software, Cambridge.

5. de Hoog, G. S., Rantio-Lehtimaeki, A. H. & Smith, M.Th., 1985. Blastobotrys, Sporothrix and Trichosporiella: generic delimitation, new species and a Stephanoascus telemorph. Antonie vanLeeuwenhoek, 51:79-109.

6. Smith, M.Th. & Batenburg-van der Vegte, W. H., 1985. Ultrastructure of septa in Blastobotrys and Sporothrix. Antonie van Leeuwenhoek, 51:121-128.

* * *

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

The strains listed below have been added to the ATCC since October 30, 1984. Complete information on these strains may be obtained upon request from the Mycology Department of ATCC.

Yeast	ATCC No.
Candida albicans	58716
Candida apis var. galacta	58429
Candida auringiensis	58430
Candida boleticola	58431
Candida buinensis	58432
Candida butyri	58433
Candida cariosilignicola	58434
Hanseniaspora guilliermondii	58435
Hanseniaspora vineae	58436
Hansenula beckii	58203
Hansenula lynferdii	58367
Hansenula philodendra	58368
Hansenula polymorpha	58401
Hansenula subpelliculosa	58202
Hansenula sydowiorum	58369
Kloeckera japonica	58370
Kloeckera sp.	58402
Kluyveromyces lactis	58584-58587

Lipomyces starkeyi	58680
Nadsonia commutata	58437
Pichia aganobii	58403
Pichia carsonii	58371
Pichia methanolica	58372
Pichia norvegensis	58681
Pichia rabaulensis	58373
Pichia saitoi	58374
Pichia segobiensis	58375
Pichia stipitis	58376
Pichia toletana	58362
Saccharomyces bayanus	58645-58647
Saccharomyces cerevisiae	58102; 58230-58231; 58447-58449; 58651
Saccharomyces kluyveri	58438
Saccharomyces prostoserdovii	58648-58650
Saccharomyces servazzi	58439
Saccharomyces unisporus	58440
Saccharomyces sp.	58508-58535
Sporidiobolus johnsonii	58441
Sporopachydermia lactativora	58442
Stephanoascus ciferrii	58443-58444
Torulopsis glabrata	58561
Trichosporon cutaneum	58666
Trigonopsis variabilis	58377; 58536
Zygosaccharomyces bailii	58445
Zygosaccharomyces fermentati	58446
Zygosaccharomyces rouxii	58389

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Abstracts of Recent Papers:

1. Jong, S.C., F.L. Lee, and L. Bengston. 1985. Direct evidence of relationship between *Dekkera* and *Brettanomyces*. Mycotaxon 23:271-273.

   New direct evidence of the relationship between the yeast form genus *Brettanomyces* and the ascosporogenous genus *Dekkera* is presented. Occurrence of ascospore formation in the type cultures (ATCC 10560, ATCC 34448 and ATCC 10559) of the three *Brettanomyces* species now classified as *Dekkera* is reported for the first time.

2. Lee, F.L. and S.C. Jong. 1985. *Dekkera claussenii* sp. nov., the perfect state of *Brettanomyces claussenii*. Mycotaxon 23:275-278.

   Dekkera claussenii sp. nov. is described to accommodate the ascosporogenous state (teleomorph) of *Brettanomyces claussenii* Custers. This species differs morphologically and physiologically from the species presently accepted in the genus *Dekkera* mainly by absence of blastese and the ability to ferment lactose.

3. Lee, F.L., and S.C. Jong. 1985. Identity of *Brettanomyces custersii*. Mycotaxon 23:279-284.

   Examination of *Brettanomyces custersii* ATCC 34447 (type), *B. intermedius* ATCC 34448 (type), *Dekkera intermedia* ATCC 36235 (type) and additional six strains reveals that they all produce asci containing 1-4 hat-shaped ascospores and are morphologically and physiologically very similar. Thus, the name *B. custersii* Florenzano, 1950, is proposed to be a later, facultative synonym of *B. intermedius* (Krumbholz et Tauschanoff) van der Walt et van Kerken, 1933, and the imperfect (anamorphic) state of *Dekkera intermedia* van der Walt, 1964.

* * *

III. The University of Western Ontario, Department of Plant Sciences, London, Canada N6A 5B7. Communicated by M.A. Lachance.

1. Deborah Sidenberg has successfully defended her Ph.D. thesis entitled "Electrophoretic isoenzyme patterns in the yeast genus *Kluyveromyces*". Dr. C.P. Kurtzman participated as the external examiner. Dr. Sidenberg will be joining the laboratory of Dr. P. Sadowski, in the Department of Medical Genetics of the University of Toronto, to pursue post-doctoral research in the area of yeast molecular genetics.

2. The following two manuscripts have been accepted for publication.

   Lachance, M.A. 1985. Current views on the yeast species. Microbiological Sciences 2(4).

Abstract

The application of the biological species concept to the delineation of yeast species is now becoming a reality. Studies centered on heterothallic Pichia and related species, and on homothallic species of Kluyveromyces have successfully identified means of circumscribing yeast populations in terms of their speciation process.

* * *

Lachance, M.A., and W.T. Starmer. The community concept and the problem of non-trivial characterization of yeast communities. J. Community Studies 1.

Abstract

The problem of non-trivial characterization of ecological specificity in yeast communities as a function of their physiological responses was examined. It was found that when overall specificity is expressed as the mean number of responses which deviate significantly from those of a theoretical random assemblage, the probability vectors associated with the responses can be defined and transformed to obtain multivariate predictors of habitat quality. Significantly, the distribution of the transformed vectors is continuous, and their relationships are linear. To explore the usefulness of the method, data from yeast communities associated with angiosperm trees were subjected to principal components analysis, and responses which depart significantly from expectations were subjected to cross-tabulation. These provided a means of visually elucidating community profiles.

* * *

IV. Laboratory of Applied Microbiology, Dept. of Agricultural Chemistry, Shizuoka University, Shizuoka 422 Japan. Communicated by Yuzo Yamada.

The following articles were recently published.

Yuzo Yamada and Isao Banno[1], 1984. The coenzyme Q system in strains of species in the genus Sterigmatomyces (Cryptococcaceae) and its teleomorphic genus Sterigmatosporidium*. Trans. Mycol. Soc. Japan 25:455-460.

[1]Institute for Fermentation, Osaka, Jusohon-machi, Yodogawa-ku, Osaka 532, Japan.

Summary

Eighteen strains of Sterigmatomyces and Sterigmatosporidium species were examined for the Co-Q system. Six species of the genus Sterigmatomyces were divided into two groups; one is comprised of the Q_9-equipped strains assigned to S. elviae and S. halophilus, and the other is comprised of the Q_{10}-equipped strains assigned to S. nectairii, S. penicillatus, S. polyborus, and S. tursiopsis. In the genus Sterigmatosporidium, only the Q_{10}-equipped strains were found. These data are discussed from the taxonomic point of view.

*This constitutes Part XII of a series entitled "Significance of the coenzyme Q system in the classification of yeasts and yeast-like organisms". For Part XI, see Literature cited (Yamada and Konda, 1984). Address reprint requests to Dr. Y. Yamada.

* * *

Yuzo Yamada and Takashi Konda. 1984. The Coenzyme Q System in Strains of Species in the Genus Itersonilia, Sporobolomycetaceae. J. Gen. Appl. Microbiol., 30, 313-315. Short Communication.

* * *

V. Japan Collection of Microorganisms. The Institute of Physical and Chemical Research (RIKEN), Wako-shi, Saitama, 351-01 Japan. Communicated by T. Nakase and Motofumi Susuki.

The following is an abstract of a poster presented at the IXth International Congress of the International Society for Human and Animal Mycology, May 19-24, Atlanta, Georgia, U.S.A.

P2-11 An Electrophoretic Comparison of Enzymes of Candida albicans and Related Species. M. Suzuki* and T. Nakase.

We investigated the electrophoretic patterns of several enzymes of Candida albicans, Candida tropicalis and related species, including some atypical strains. Yeasts were cultivated in YM broth for 24 hr at 25°C, and disrupted in Tris-HCl buffer, pH 7.8, with a mechanical cell homogenizer. After centrifugation, the supernatant was used as a crude enzyme source. Slab gel electrophoresis using 7.5% polyacrylamide gel was performed. Enzymes were stained by conventional methods. Malate dehydrogenase and fumarase of C. albicans and C. tropicallis showed different patterns from each other. Namely, malate dehydrogenase and fumarase of C. tropicalis (including sucrose-negative strains) showed two bands and one band, respectively, whereas these enzyme of C. albicans (including germ tube negative strains, C. claussenii and C. stellatoidea) showed different patterns from C. tropicalis, and these patterns were divided into three types, respectively. The enzyme types of C. albicans did not have any relation to its serotypes. These results clearly indicate that both typical and atypical strains of C. albicans can be distinguished from strains of C. tropicalis based on these enzyme patterns. The electrophoretic comparison of enzymes is one of the useful tools for identification of C. albicans and C. tropicalis, isolated from clinical materials, especially, atypical strains of these species such as germ tube negative strains of C. albicans and sucrose-negative strains of C. tropicalis. Such atypical strains can not be so easily distinguished by conventional identification systems including serological tests.

* * *

Publications:

1. Takashi Nakase and Motofumi Suzuki. 1985. Taxonomic Studies on Debaryomyces Hansenii (ZOPF) Lodder et Kreger-van Rij and Related Species. I. Chemotaxonomic Investigations. J. Gen. Appl. Microbiol., 31:49-69.

Taxonomic studies on Debaryomyces hansenii (ZOPF) Lodder et Kreger-van Rij and related yeast species were carried out using chemotaxonomic methods including DNA base composition, DNA-DNA hybridization, ubiquinone system, proton magnetic resonance spectrum of mannan, and serological methods. The 50 strains employed were classified into 3 groups I, II, and III, based on DNA-DNA hybridization experiments. These groups were considered to represent three distinct species. Group I consisted of two subgroups, Ia and Ib, which were considered to represent two distinct varieties. These groups were also characterized by proton magnetic resonance spectra of alkali-extracted mannans and cell surface antigens; however, they could not be discriminated by DNA base composition and ubiquinone systems, in addition to the taxonomic criteria commonly employed in yeast taxonomy. Group Ia comprised 34 strains including the type or authentic strains of D. hansenii, D. nicotianae, D. nicotianae var. minor, D. kloeckeri, D. kloeckeri var. major, D. tyrocola, D. gruetzii, D. matruchoti, D. matruchoti var. cesarii, D. hildegaardi, D. guilliermondii, D. miso, Torulopsis westerdijkii, T. famata, and T. minor. Group Ib comprised 6 strains including the type or authentic strains of D. subglobosus, D. fukuyamaensis, Pichia adzetii, and Candida flareri. Group II comprised 4 strains including the type or authentic strains of D. nepalensis, D. cavensis, and D. japonicus. Group III comprised 6 strains including the type strain of T. candida.

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2. Takashi Nakase and Motofumi Suzuki, 1985. Taxonomic Studies on Debaryomyces Hansenii (ZOPF) Lodder et Kreger-van Rij and Related Species. II. Practical Discrimination and Nomenclature. J. Gen. Appl. Microbiol., 31:71-86.

Comparative Taxonomic studies were carried out on strains of groups I, II and III, and subgroups Ia and Ib of Debaryomyces hansenii and related species which were found in the preceding paper on the basis of chemotaxonomic investigations, for the practical discrimination and clarification of nomenclature. These groups and subgroups could be discriminated from one another by maximum growth temperature, assimilability of propylene glycol, and electrophoretic patterns of glucose-6-phosphate dehydrogenase (G6PDH, EC 1.1.1.49) and malate dehydrogenase (MDH, EC 1.1.1.37), in addition to the criteria reported in the preceding paper.

Strains of group III (Candida saitoana nov. nom.) could be easily discriminated from strains of other groups by their ability to assimilate propylene glycol and electrophoretic relative mobilities of G6PDH and MDH, in addition to their characteristic patterns of PMR spectra of mannans and cell surface antigens. Strains of subgroup Ia (Debaryomyces hansenii var. hansenii-Candida famata var. famata) could be discriminated by their low maximum growth temperature and the lack of G6PDH activity. Discrimination of strains of subgroup Ib (Debaryomyces hansenii var. fabryi nov. comb.-Candida famata var. flareri nov. comb.) from those of group II

(Debaryomyces nepalensis-Candida naganishii nov. sp.) is not so easy in the present study. At present, electrophoretic comparison of MDH is the most convenient method for the separation of group II and subgroup Ib from each other because the differences found in the patterns of PMR spectra of mannans and cell surface antigens are not so clear cut in several strains.

* * *

VI. Department of Food Science and Technology, University of California, Davis, CA 95616. Communicated by H.J. Phaff.

The following papers have been published or are in press following the listing in the Yeast Newsletter of June 1984 (Vol. 33, No. 1).

1. Herman J. Phaff, William T. Starmer*, Joanne Tredick, and Mary Miranda. 1985. Pichia deserticola and Candida deserticola, Two New Species of Yeasts Associated with Necrotic Stems of Cacti. International Journal of Systematic Bacteriology, 35:211-216.

*Department of Biology, Syracuse University, Syracuse, New York 13210.

We describe Pichia deserticola and Candida deserticola, two species that have as their habitats necrotic tissues of Opuntia spp. and Stenocereus spp., respectively. Pichia deserticola, 21 strains of which were isolated, is homothallic and occurs in nature exclusively in the diploid state. It produces asci with two hat-shaped spores, which are rapidly released upon maturity. This species is nonfermentative and assimilates few carbon compounds. The guanine-plus-cytosine content range of the nuclear deoxyribonucleic acid (eight strains) is 27.4 to 28.4 mol%, and the average ± standard deviation for eight strains is 27.8 ± 0.4 mol%. Candida deserticola, 48 strains of which were isolated, has the same phenotypic properties and deoxyribonucleic acid base composition as P. deserticola, but lacks the ability to produce ascospores and is resistant to triterpene glycosides in growth media. The deoxyribonucleic acids of P. deserticola and C. deserticola show more than 96% homology, but the two species are separated geographically and by host plant. P. deserticola occurs in Opuntia species in southern Arizona and Texas, whereas C. deserticola is found almost exclusively in columnar cacti of the genus Stenocereus on certain Caribbean islands and in Baja California, Mexico. The type strain of P. deserticola is strain UCD-FSt 83-467.3 (=ATCC 58091 = CBS 7119), and the type strain of C. deserticola is strain UCD-FST 76-355A (=ATCC 58088 = CBS 7121).

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2. Eveline Guého[1], Joanne Tredick[2], and Herman J. Phaff[2]. 1985. DNA Relatedness Among Species of Geotrichum and Dipodascus. Can. J. Botany 63:961-966.

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

[2]University of California, Davis, Department of Food Science and Technology, Davis, CA 95616, U.S.A.

Abstract

The relatedness among species maintained as Geotrichum and Dipodascus (imperfect and perfect states) from their morphology, physiology and ascomycetous characters were studied by techniques of nucler genome comparison in combination with nuclear deoxyribonucleic acid base composition. G. fici exhibited 95% DNA base sequence complementarity with G. fragrans and was considered synonymous with G. fragrans. Two G. penicillatum strains exhibited 97-100% base sequence complementrity with G. klebahnii, and G. penicillatum is thus a later synonym of G. klebahnii. G. capitatum, G. klebahnii (which has priority over G. penicillatum), G. armillariae and G. fragrans (which has priority over G. fici) can be considered as separate species and different from the type, G. candidum. Dipodascus geotrichum, which is considered the perfect state of G. candidum, showed a low but significant relationship to its proposed anamorph (about 45% relative binding of its DNA) but no other associations between perfect and imperfect forms could be detected. Our results suggest that in addition to current taxonomic criteria DNA comparisons also appear to be extremely valuable in making phylogenetic comparisons.

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3. D.L. Holzschu, H.J. Phaff, Joanne Tredick and Dennis Hedgecock*. 1985. Resolution of varietal relationship within the species Pichia opuntiae and establishment of a new species Pichia thermotolerans comb. nov. Int. J. Syst. Bacteriol. 35:(3) (in press).

*Bodega Marine Laboratory, University of California, Bodega Bay, CA 94923.

Abstract

The varietal relationship within the species Pichia opuntiae was determined by a study of deoxyribonucleic acid (DNA) relatedness and by comparison of the electrophoretic mobility of twelve metabolic enzymes. The nuclear genomes of P. opuntiae var. opuntiae and P. opuntiae var. thermotolerans showed about 28% relative binding to hydroxylapatite in intervarietal DNA reassociation experiments and allozymes encoded by eight loci were different in the two taxa. Based on these molecular criteria, as well as allopatry, different host plants, and weak sexual interaction, P. opuntiae var. thermotolerans was raised to the rank of species, Pichia thermotolerans (Starmer et al.) Holzschu et al. comb. nov.

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4. Mendonça-Hagler, L.C., A.N. Hagler, H.J. Phaff, and J. Tredick, 1985. DNA relatedness among aquatic yeasts of the genus Metschnikowia and proposal of the species Metschnikowia australis comb. nov. Can. J. Microbiol. (submitted for publication).

Abstract

DNA hybridization studies were conducted to determine the taxonomic status of the aquatic group of Metschnikowia species and their varieties. Among the four varieties of M. bicuspidata, M. bicuspidata var. australis showed 37 to 51% DNA homology with M. bicuspidata var. bicuspidata and with

the varieties chathamia and californica. On this basis, low intervarietal fertility, and unique habitat in antarctic sea water, we have proposed to raise M. bicuspidata var. australis to the rank of species, M. australis comb. nov. DNA complementarity of M. bicuspidata var. californica and M. bicuspidata var. chathamia DNA was greater than 80% with that of M. bicuspidata var. bicuspidata. M. australis can be differentiated from other Metschnikowia species and varieties by its inability to form chlamydospores, the formation of two needle-shaped ascospores per ascus, lack of glucose fermentation, and lack of assimilation of both methyl-α-D-glucoside and glucono-δ-lactone. Other DNA homology experiments showed that M. zobellii is a distinct species when compared to both aquatic and terrestrial species of the genus.

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5. J.S.F. Barker, P.D. East, H.J. Phaff, and M. Miranda. 1984. The ecology of the yeast flora in necrotic Opuntia cacti and of associated Drosophila in Australia. Microb. Ecol. 10:379-399 (for abstract see Yeast Newsletter XXXIII (1) p. 8, 1984).

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VII. Muséum National d'Histoire Naturelle; Laboratoire d' Ethologie, Parc Zoologique, 53 Avenue de Saint Maurice, 750 12 Paris, France. Communicated by Henri Saëz.

The following papers have been published during the past several years.

Saëz, H. et T.L. Nguyen. 1981. Differences morpho-biochimiques observées sur deux lots de souches sauvages de Cryptococcus albidus. Annales de Parasitologie (Paris), 56:(4) 449-458.

Saëz, H., J. Rinjard et Kornelia Kurdi. 1981. Parasitoses décelées parmi cinq espèces de Cygnes captifs. Zool. Garten N.F., 3-4, 170-176.

Saëz, H. et J. Rinjard. 1981. Bilan mycologique d'un Grand Panda male le jour de sa mort en captivité au Parc zoologique de Paris. Acta Zoologica et Pathologica Antverpiensia, 76:3-8.

Saëz, H., L. Strazielle et Kornélia Kurdi. 1982. Etude écologique de Torulopsis glabrata dans une population de mammiferes sauvages captifs. Mykosen, 25(3): 151-158.

R. Grillot, J. Chouteau, P. Guy, H. Saëz et P. Ambroise-Thomas. 1982. Les levures dans les sirops de fruits. Intérêt de leur surveillance et de leur identification dans une chaine de fabrication industrielle. Bulletin de la Société Française de Mycologie Médicale, II, I:9-13.

Saëz, H., T.L. Nguyen et M.A. Castro. 1982. Sensible augmentation du portage de Cryptococcus albidus, enregistrée entre 1959 et 1979 au Parc zoologique de Paris. Bulletin Mensuel de la Société Linnéenne de Lyon, 51:(7) 225-232.

Saëz. H. 1982. Mycoflore de l'oreille saine animale. Rapports avec la flore digestive et les micromycètes de l'air. Zentralblatt für Veterinärmedizin, B, 28°, 653-662.

Saëz, H. 1982. Pityrosporum pachydermatis: caractéristiques morpho-biochimiques, fréquence comparée chez l'animal et l'homme. Annales de Médecine Vétérinaire (Bruxelles), 126:645-650.

Saëz, H. et Fatima Traore 1984. Morphogenèse de Candida albicans dans le sérum humain. Tubes mycéliens et pseudomycéliens observés sur 250 souches. Pathologie Biologie, 32:(3) 160-164.

Lavarde V., F. Daniel, H. Saëz, M. Arnold et B. Faguer 1984 Péritonite mycosique à Torulopsis haemulonii. Bulletin de la Société Française de Mycologie Médicale, I:173-176.

Saëz, H. et L. Rodrigues de Miranda 1984. The yeast Candida sequanensis sp. nov. Antonie van leeuwenhoek, 50:379-381.

From November 1983 to December 1984 a student in dental surgery, Mr. Jean-Andre Bore, has visited my laboratory in the Parc Zoologique to prepare a dissertation on the subject "Contribution to the study of buccal candidose and its complications in humans and in primates." He completed his thesis and obtained the degree of doctor of Dental Surgery on March 27, 1984 (Thesis No. 2239).

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VIII. W.I. Golubev, Inst. Biochem. and Physiol. of Micro-organisms, All-Union Collection of Micro-organisms, USSR Academy of Sciences, Pushchino, Moscow Region I42292, USSR. Communicated by W.I. Golubev.

Recent publication from our Institute are as follows:

1. Golubev, W.I., Manukyan, A.R., Lazarev, P.I.., 1984. Functions of yeast capsules. Jurnal obshchei biologii (J. gen. Biol.), 45, 507.

Summary

Encapsulated organisms predominate in the yeast flora of habitats poor in available nutrients. Unlike non-encapsulated yeasts, they are able to utilize these substances at low concentrations more effectively as well as to take up gaseous compounds. As opposed to the universally adopted opinion of a capsule as an additional layer protecting the cell against disturbing environmental factors, it has been found that the formation of a capsule in yeasts is their adaptation to existence under conditions of low concentrations of available nutrients in the environment.

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2. Golubev, W.I., Golubeva, I.V., 1985. Metschnikowia lunata, a model for the study of dimorphism. Mikrobiologya, 54, N 3 (in press).

Summary

The proposed minimal synthetic media and incubation conditions make it possible to obtain M. lunata cultures composed either of lunate or oval cells by 90% or more. The results obtained, the biology of this yeast and the fact that both morphological forms are single-celled, allow it to be considered as a suitable object for fundamental studies of dimorphism in fungal organisms. Long-term cultivation under specified conditions weakens the morphological response and changes the physiological properties.

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IX. Departamento de Patologia Tropical, 69000 Manaus, Brazil.
Communicated by Wai Yin Mok.

The following two communications were presented at the First International Colloquium on Pathology of Reptiles and Amphibians held from September 29 to October 2, 1982 in Angers, France (C. Vago and G. Matz, eds.).

1. Wai Yin Mok, Celso Morato de Carvalho, Luiz Carlos Ferreira, and Jose Wilson S. Meirelles. Natural Mycoctic Infections in Amazonian Anurans.

Abstract

In a study of 186 Amazonian toads and frogs, 33 animals (Bufo granulosus, B. marinus, Dendrophryniscus sp.n., Hyla lanciformis, Ololygon rubra, Adenomera hylaedactyla, Adenomera sp., Eleutherodactylus fenestratus, Leptodactylus ocellatus) were found to harbor yeasts or dematiaceous fungi. The internal organs of these animals did not show any macroscopic anomaly or histopathology. Eighty-two fungal isolates were recovered from the amphibian livers, spleens, kidneys and lungs. The isolates were made up of 22 fungal species which included the following pathogens: Candida guilliermondii, C. parapsilosis, C. tropicalis, Torulopsis glabrata, Trichosporon beigelii, Geotrichum candidum, Exophiala werneckii and Wangiella dermatitidis. Identical fungal infection in multiple organs was observed in 10 animals; mixed infection by several fungi in a single organ was observed in 8 animals. These represent natural subclinical mycotic infections or anuran carriage of fungi.

2. Wai Yin Mok, Luis Carlos Ferreira, Celso Morato de Carvalho, and Jose Wilson S. Meirelles. Generalized Opportunistic Mycotic Infection in a River Turtle Podocnemis unifilis (Chelonia:Pelomedusidae).

Abstract

We observed a case of generalized mycotic infection due to Rhodotorula rubra, Torulopsis holmii, Candida sp. and zygomycetes in an immature yellow-spotted Amazon side-neck turtle (Podocnemis unifilis) that showed carapace rot, panniculitis and modified pigmentation on its ventral shell. The animal had been severely debilitated due to malnutrition and debris buildup in its captive surroundings. This case illustrates the classical pattern of mycotic diseases in reptiles, i.e., opportunistic

invasion by facultative pathogens in an enfeebled captive host. (NOTE: The Candida isolate has been identified, on further testing, as Candida sake.)

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3. Mok, W.Y., and M.S. Barreto da Silva. 1984. Mycoflora of the human dermal surfaces. Can. J. Microbiol. 30:1205-1209.

Abstract

The mycotic flora of the scalp and interdigital areas of the hand and foot of 1296 apparently healthy human inhabitants of three Amazonian communities were surveyed by means of microscopic examination of epidermal scrapings and cultural isolation on Mycosel agar. No macroscopic or microscopic evidence of fungal infection was detected in any of our study subjects. From 133 (10%) individuals, 143 fungi representing 13 genera and 39 species were recovered. Yeasts constituted 85% of the fungi. Seventy-five percent of the isolates were fungi with pathogenic potential: Aureobasidium pullulans, Candida albicans, Candida guilliermondii, Candida parapsilosis, Candida stellatoidea, Candida tropicalis, Exophiala werneckii, Geotrichum candidum, Rhodotorula rubra, Torulopsis glabrata, Trichophyton tonsurans, Trichosporon cutaneum and Wangiella dermatitidis. The low frequency with which each species was represented resulted in a mosaic distribution of the fungi with respect to human anatomical sites and study areas. The lack of similarity in species composition between the human dermal mycoflora and soil mycoflora in the same study areas supports the conclusion that distinct yeast species occupy different environmental niches.

X. Department of Biological Sciences, Thames Polytechnic', Wellington Street, London SE 18, England. Communicated by J.F.T. Spencer.

Below follow abstracts of two recent papers from our laboratory.

1. J.F.T. Spencer[1,2], D.M. Spencer[2], C. Bizeau[3], Ann Vaughan Martini[4] and A. Martini[4]. 1985. The Use of Mitochondrial Mutants in Hybridization of Industrial Yeast Strains. V. Relative Parental Contributions to the Genomes of Interspecific and Intergeneric Yeast Hybrids Obtained by Protoplast Fusion, as Determined by DNA Reassociation. Current Genetics (in press).

[2]Department of Life Sciences, Goldsmiths' College, Rachel MacMillan Building, Creek Road, London SE8, England.

[3]Institut National de la Recherche Agronomique, 34060 Montpellier Cedex, France.

[4]Istituto di Biologia Vegetale, Sezione di Microbiologia, Universita di Perugia, Borgo XX Giugno, 74, I-06100 Perugia, Italy.

Summary

The contributions of each of the parental strains to the genomes of

the sporulating and non-sporulating hybrids, Saccharomyces diastaticus (S. cerevisiae) x Hansenula capsulata, S. diastaticus x Candida pseudotropicalis (Kluyveromyces marxianus), S. diastaticus x Saccharomyces rouxii, S. diastaticus x Saccharomyces kluyveri, and Saccharomyces diastaticus x Saccharomyces bayanus, obtained by protoplast fusion, were determined by the methods of whole nuclear DNA-DNA reassociation. Petite mutants of S. diastaticus NCYC 625, and respiratory-competent strains of the other species, were used. In all of the hybrids but one, the DNA from the S. diastaticus parent showed 93.3 to 109.3% homology with the DNA from the hybrids, and the other parents, from -7.7% (S. kluyveri) to 20.0% (S. bayanus). Reassociation between the DNA from S. diastaticus and the DNA from the other parental strains ranged from 4.7 to 19.4%. Reassociation between DNAs from S. diastaticus and that of the S. diastaticus x T. glabrata fusion hybrids were 15.2 and 18.9%, respectively. Further investigation of this hybrid is desirable. The fusion products were relatively stable as compared to some fusion hybrids selected by use of nuclear markers, and could be maintained on normal media, with little or no selection pressure, but use of an appropriate carbon source. In most of the hybrids, except for S. diastaticus x T. glabrata, the S. diastaticus parent contributed most of the genome, and only a single chromosome, or a fragment of a chromosome, appeared to be transferred to the Saccharomyces nucleus, to form the genome of the fusion product.

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2. J.F.T. Spencer[1,2], C. Bizeau[3], N. Reynolds[2] and Dorothy M. Spencer[2]. 1985. The Use of Mitochondrial Mutants in Hydridization of Industrial Yeast Strains. VI. Characterization of the Hybrid, Saccharomyces diastaticus X Saccharomyces, Obtained by Protoplast Fusion, and Its Behavior in Simulated Dough-Raising Tests. Submitted to Current Genetics.

Summary

A hybrid between Saccharomyces diastaticus, an industrial yeast strain of the Saccharomyces cerevisiae group, and Saccharomyces (Zygosaccharomyces) rouxii, an osmotolerant species, was constructed by protoplast fusion and characterized. The hybrid was similar to the S. diastaticus parent in its fermentation and sugar utilization patterns, but was tolerant of sugar concentrations that were higher than those permitting growth of the S. diastaticus parent. In addition, the DNA from the hybrid showed a much higher degree of reassociation with the DNA from the S. diastaticus parent than with that of the S. rouxii strain. The hybrid sporulated and produced viable spores, after being maintained in culture for a number of generations, and yielded clones which also sporulated and were therefore homothallic. The segregants from several asci formed by these hybrids were tested for their ability to increase the volume of a simulated bread dough and of a sweet dough, containing additional sucrose, and some of them had a much greater dough-raising capacity than either the original hybrid or a commercial baker's yeast, grown under similar conditions.

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XI. Institute for Genetics of Microorganisms, Dorozhnaya 8, Moscow 113545, USSR. Communicated by G.I. Naumov.

The following two articles have appeared recently.

1. M.M. Vystin and G.I. Naumov, 1984. Anomalies in meiosis of hybrids in biological species of the yeast genus Williopsis. Biological Sciences No. 7:82-87.

Abstract

It has been found that there is no normal meiosis during ascus formation of biological species of the genus Williopsis. Cultures heterozygous for the control of auxotrophic markers are met with high frequency among the prototrophic meiotic segregants. It has been suggested to estimate the genetic exchange between species by the presence of double auxotrophic recombinants.

2. M.N. Shuroff and G.I. Naumov, 1984. Hybridization study of the yeast Hansenula anomala var. anomala of different origins. Biological Sciences No. 11:88-91.

Abstract

Using auxotrophic mutants hybridization on selective media and recombination in the yeast Hansenula anomala var. anomala has been studied. 11 strains of different origins have been investigated. The life cycle has been determined. These yeasts are diplonts. It has been found that there are both heterothallic and homothallic strains in nature. Inter- and intrastrain hybrids have been studied. Data on meiotic segregation of auxotrophic markers allow to conclude that H. anomala var. anomala is able to form polyploid hybrids.

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XII. Department of Genetics, Microbiology and Biophysics, Faculty of Science, Charles University, Prague, Czechoslovakia. Communicated by Olga Bendová.

Palková, Z., Závada V., Bendová, O. 1985. Transfer of a dex gene from Saccharomyces diastaticus to Saccharomyces cerevisiae by means of a cosmid vector. Folia Microbiol. (in press).

The gene library of S. diastaticus was constructed in E. coli by cloning a partial EcoRI digest of DNA from S. diastaticus into EcoRI site of the shuttle cosmid vector pYc1 (Hohn and Hinnen, 1980) and transfecting E. coli (amp^S, r^-) with pseudoviral particles prepared by packaging the ligation mixture into empty lambda heads (Sternberg et al., 1977). Spheroplasts prepared from a mixture of several thousand amp^r clones of this gene library were fused with protoplasts of S. cerevisiae his^- (input about 1000:1). About 1% of his^+ yeast transformants were able to hydrolyse starch and dextrins.

Hohn, B., Hinnen, A., (1980). Cloning with cosmide in E. coli and yeasts, Genetic engineering 2:169-183.

Sternberg, N., Tiemeier, D., Enguist, L., (1977). In vitro packaging of a Dam vector containing EcoRI DNA fragments of Escherichia coli and phage P1, Gene 1:255-280.

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XIII. Institute of Marine Resources, University of California, Davis, CA 95616. Communicated by David Ogrydziak.

Below follows the abstract of the Ph.D. Dissertation in the field of Microbiology by Suk-Chun Cheng. The project was done under the guidance of Professor David Ogrydziak.

Extracellular Ribonuclease Secreted by Saccharomycopsis lipolytica

Abstract

The yeast Saccharomycopsis lipolytica (Wickerham, Kurtzman et Herman) Yarrow (1972), ATCC #32338 (classified as Yarrowia lipolytica by van der Walt and von Arx, 1980), secretes a single extracellular ribonuclease in media with a pH opt. of 5-7. The enzyme was produced during exponential growth and was regulated by nitrogen, carbon, and phosphate nutrients present in the media. The ability of individual nitrogen sources to derepress extracellular ribonuclease production decreased in the order: casein > digested casein > proteose-peptone > peptone > ammonium sulfate > mixture of amino acids. Production of the enzyme increased significantly with citrate (0.1 M), only slightly or not at all with RNA (2 g/1 or less), and it was repressed slightly with a high level of phosphate (0.2 M versus 0.1 M).

When S. lipolytica was grown in glycerol-proteose-peptone media, a 43,000 dalton ribonuclease was purified by a combination of ion-exchange (DEAE-Sephacel) and affinity chromatography (agarose 5'-(p-aminophenyl-phosphoryl)-uridine 2'(3') phosphate) and preparative SDS-PAGE followed by electroelution. During purification of the enzyme, another ribonuclease of smaller size (mol wt 34,000), which could not be separated from the major ribonuclease, was consistently found. Both the 34,000 and 43,000 dalton ribonucleases were shown, however, to be derived from a 45,000 dalton ribonuclease by degradation.

The purified 43,000 dalton ribonuclease had a pI of 4.8 and was most active at pH 6.5-7.0 when measured at 40°C. The active enzyme was composed of a single subunit.

Antiserum which was raised against SDS-denatured, purified ribonuclease immunoprecipitated a 45,000 dalton polypeptide from labelled cell extracts and supernatant media. The polypeptide was secreted with a transit time of 5 min and a half-time of secretion of at least 11 min. A 73,000 dalton polypeptide which was also immunoprecipitated from labelled cell extracts was proven to be the precursor of the ribonuclease by both kinetic studies and one-dimensional peptide mapping. Since the 73,000 dalton ribonuclease was a glycoprotein (with less than 10% N-linked carbohydrate) and was considerably larger than the mature ribonuclease which contained no N-linked carbohydrate, the ribonuclease is thought to

undergo at least two processing steps before it is secreted into the medium. The first step would be addition of carbohydrate and the second a proteolytic cleavage of a large peptide fragment containing the N-linked carbohydrate.

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XIV. Department of Molecular Biology and Genetics, University of Guelph, Guelph, Ontario, Canada. Communicated by R.E. Subden.

The following is the abstract of the paper recently submitted to Can. J. Microbiol. for publication:

C. Osothsilp and R.E. Subden. Isolation and Characterization of Schizosaccharomyces pombe mutants with Defective NAD-Dependent Malic Enzyme.

Abstract

To obtain NAD-dependent malic enzyme mutants of Schizosaccharomyces pombe, a colony color indicator screening system was developed. Mutants defective for malic acid utilization (mau mutants) are yellow while wild type colonies are blue on the defined bromcresol green-based indicator medium. NAD dependent malic enzyme mutants were distinguished from other mau mutants by subsequent starch gel electrophoresis, spectrophotometry, complementation tests, and intermediate pool analysis with cell free extracts.

Malate dehydrogenase and putative permease defective mutants are being characterized. Availability of various malate-defective mutants makes it possible to study the genetic regulation of malate degradation in S. pombe. Molecular cloning and further characterization of the genes involved in malate utilization are in progress.

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XV. Technische Hogeschool Delft, Laboratorium voor Microbiologie, Julianalaan 67A, 2628 BC Delft, The Netherlands. Communicated by W. A. Scheffers.

The following two papers, abstracts of which have already been presented in Yeast Newsletter Vol. XXXIII, Number II, pp. 89-90, now have been published:

1. H. van Doorne, W. A. Scheffers, M. Hadiutomo, and E. van den Bosch. 1984. Microbial contamination of a vitamin A formulation, prepared in local pharamacies, and its preservation against yeasts and moulds. Antonie van Leeuwenhoek 50:405-416.

2. C.Verduyn, R. van Kleef, J. Frank, H. Schreuder, J. P. van Dijken, and W.A. Scheffers. 1985. Properties of the NAD(P)H-dependent aldose reductase from the xylose-fermenting yeast Pichia stipitis. Biochemical Journal 226:669-677.

The following three papers are forthcoming:

3. Peter M. Bruinenberg, Johannes P. van Dijken, J. Gijs Kuenen, and W. Alexander Scheffers*. Journal of General Microbiology, in press. Critical Parameters in the Isolation of Mitochondria from Candida utilis Grown in Continuous Culture.

Abstract

The successive steps in the isolation of mitochondria from chemostat-grown Candida utilis have been investigated systematically for their effects on organelle integrity. Growth rate had a profound effect on the susceptibility of carbon-limited cells towards Zymolyase, whereas the nature of the carbon source had no effect. Stabilization of spheroplasts with at least 2 M-sorbitol was required to prevent premature lysis. This was concluded from the amounts of glucose-6-phosphate dehydrogenase liberated during Zymolyase treatments. The influence of the method for disruption of spheroplasts on the quality of the mitochondria was analysed with particular emphasis on respiratory control values and the distribution of marker enzymes among the cell fractions. Disruption by osmotic shock resulted in mitochondria without respiratory control and a high degree of solubilization of NADH and NADPH dehydrogenase activities. Only a gradual decrease of the osmotic value of the medium, preferably by dialysis against a hypotonic buffer, in combination with mechanical disruption with a Potter-Elvehjem homogenizer yielded mitochondria with high respiratory control values and a high retention of NADH dehydrogenase in the organelle. It is concluded that, for the quality of mitochondrial preparations from yeasts, the distribution of NADH dehydrogenase over the cell fractions is a more reliable measure than that of the usual marker enzymes.

4. Peter M. Bruinenberg, Johannes P. van Dijken, J. Gijs Kuenen, and W. Alexander Scheffers*. Oxidation of NADH and NADPH by Mitochondria from the Yeast Candida utilis. Journal of General Microbiology, in press.

Abstract

Mitochondria were isolated from Candida utilis CBS 621 grown in carbon-limited continuous cultures on glucose, gluconate, xylose, ethanol or acetate as the carbon sources and ammonia or nitrate as the nitrogen sources. In all cases mitochondria were isolated which could oxidize exogenous NADH and NADPH via a cyanide-and antimycin A-sensitive but rotenone-insensitive respiratory chain. Oxidation of NADH and NADPH was coupled to energy conservation as evidenced by high respiratory control values. Different respiratory control values of mitochondria with NADH and NADPH as well as variations in the ratio of NADH and NADPH oxidase activities indicate that separate systems exist for the oxidation of exogenous redox equivalents by mitochondria of C. utilis.

Variation of the NADPH requirement for biomass formation by applying different growth conditions did not result in significant changes in NADPH oxidase activities of mitochondria. It is concluded that in C. utilis NADPH can be used in dissimilatory processes for the generation of ATP.

5. Peter M. Bruinenberg, Ronald Jonker,Johannes P. van Dijken and W. Alexander Scheffers*. Utilization of formate as an additional energy souce by glucose-limited chemostat cultures of Candida utilis CBS 621 and Saccharomyces cerevisiae CBS 8066. Evidence for the absence of transhydrogenase activity in yeasts. Archives of Microbiology, in press.

Abstract

Candida utilis CBS 621 and Saccharomyces cerevisiae CBS 8066 were grown in glucose-limited chemostate cultures with formate as an additional energy source. In both yeasts formate was oxidized via a cytoplasmic NAD+-linked formate dehydrogenase. Other formate-oxidizing enzymes could not be detected.

With Candida utilis the steady-state cell yield on glucose increased with increasing amounts of formate in the medium until growth became carbon-limited. The maximum growth yield on glucose in the presence of excess formate was dependent on the nitrogen source used for growth. With ammonium and nitrate the maximum yields were 0.69 and 0.56g cells/g glucose, respectively. Calculations showed that this difference correlates with the NADPH requirement for biomass formation with these two nitrogen sources. This implies that the NADH produced from formate oxidation cannot replace the NADPH needed for biomass formation. It therefore is concluded that in Candida utilis transhydrogenase activity is absent.

Also Saccharomyces cerevisiae was capable of oxidizing formate in glucose-limited chemostat cultures. However, in contrast to Candida utilis utilization of formate by this yeast did not enhance the cell yield on glucose.

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XVI. National Research Council Canada, Plant Biotechnology Institute, 110 Gymnasium Road, University Campus, Saskatoon S7N 0W9, Sask., Canada. Communicated by J.W.D. GrootWassink.

The following papers have recently appeared:

1. K.S. Lam and J.W.D. GrootWassink, 1985. Efficient, non-killing extraction of β-D-fructofuranosidase (an exo-inulase) from Kluyveromyces fragilis at high cell density. Enzyme Microb. Technol., 7:(May) 239-242.

A simple and rapid procedure has been developed for the large-scale extraction of an exo-inulase (β-D-fructofuranoside fructohydrolase, EC 3.2.1.26) from the cell wall of a hyperproducing Kluyveromyces fragilis yeast strain. It involves resuspending fresh cells at a density of ~100 g/l (dry weight) in 0.3M potassium phosphate, pH 7-8, containing 8 mM L-cysteine (0.096%, w/v), and holding the temperature at 25-30°C. Complete inulase release occurred within 30 min, yielding an extract with an apparent inulase purity of ~50%. The extraction did not reduce the viability of the cells.

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2. E.W.T. Tsang and J.W.D. GrootWassink, 1985. Visual Detection of β-Fructofuranosidase (Inulase)-Regulatory Mutants of Kluyveromyces fragilis. Biotechnology Letters 7:(No. 3) 179-184.

Summary

Inulase constitutive mutant cells of the yeast Kluyveromyces fragilis were enumerated in continuous culture cell populations. After cloning and growth on glycerol agar plates, mutant colonies stained red when exposed to a mixture of sucrose and a chromogenic reagent for glucose.

Mutants with improved inulase production on glucose were isolated from opaque agar plates containing undissolved inulin. Mutant colonies were surrounded with clearing zones. Attempts to isolate similar mutants by selection for 2-deoxyglucose resistance proved unsuccessful with K. fragilis.

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XVII. Botanisches Institut der Universität Düsseldorf, Universitätsstrasse 1, D-4000 Düsseldorf, F.R.G. Communicated by George Michaelis.

Gertrud Mannhaupt, Konrad Beyreuther, and Georg Michaelis. Cytochrome b, the Var 1 Protein, and Subunits I and III of Cytochrome c Oxidase are Synthesized Without Transient Presequences in Saccharomyces cerevisiae.

European Journal of Biochemistry, in press.

Summary

The N-termini of four mitochondrial translation products, the var 1 protein, cytochrome b, and subunits I and III of cytochrome c oxidase have been characterized in Saccharomyces cerevisiae and compared with the known DNA sequences of the respective structural genes. The four mature proteins correspond to the predicted primary translation products and retain the formylated methionine residue. Thus, subunit II of cytochrome c oxidase studied previously by us (Pratje et al. (1983) EMBO J. 2, 1049-1054) is so far the only mitochondrial translation product carrying a N-terminal extended transient presequence in Saccharomyces cerevisiae.

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XVIII. Biochemisches Institut der Universität Freiburg, Hermann-Herder-Str. 7, D-7800 Freiburg i. Br., F.R.G. Communicated by Dieter H. Wolf.

Tilman Achstetter, Claudia Ehmann and Dieter H. Wolf, 1985.

Proteinase yscD. Purification and Characterization of a New Yeast Peptidase. J. Biol. Chem. 260:4585-4590.

A newly recognized peptidase, designated proteinase yscD, was purified from the yeast Saccharomyces cerevisiae. The enzyme cleaves the Pro-Phe-

bond of the synthetic peptide substrate Bz-Pro-Phe-Arg-4-nitroanilide and the Ala-Ala-bond of Ac-Ala-Ala-Pro-Ala-4-nitroanilide, Ac-Ala-Ala-Pro-Phe-4-nitroanilide, and MeO-Suc-Ala-Ala-Pro-Met-4-nitroanilide with high efficiency (Bz-, Ac- and MeO-Suc are defined as benzoyl, acetyl and methoxy-succinyl, respectively). |^{3}H|Methyl-casein does not serve as a substrate. Optimum pH for cleavage of Bz-Pro-Phe-Arg-4-nitroanilide is in the range of between 6.5 and 7, for Ac-Ala-Ala-Po-Ala-4-nitroanilide between 5.75 and 6. For MeO-Suc-Ala-Ala-Pro-Met-4-nitroanilide pH optimum was found to be 5.5. The purified enzyme has an apparent Stokes radius of R_s = 37.9 Å as judged by gel chromatography. Sodium dodecyl sulfate polyacrylamde gel electrophoresis indicates a molecular weight of approximately 83,000 for the enzyme. Mercurials and EDTA were found to be potent inhibitors of proteinase yscD activity.

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XIX. Department of Biological Sciences, Univ. of Illinois at Chicago, Box 4348, Chicago, IL 60680. Communicated by Fritz Schlenk.

Recent publications include the following:

1. The discovery of enzymatic transmethylation. F. Schlenk (1984), Trends in Biochem. Sci. 9:34-35.

2. The dawn of nicotinamide coenzyme research. F. Schlenk (1984), Trends in Biochem. Sci. 9:383-386.

3. Methylthioadenosine. F. Schlenk (1983), Advances in Enzymology, 54:195-265.

In each instance, yeast as a source material for the isolation of crucial compounds has played an important role in opening new fields of research.

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XX. Université de Nantes, U.E.R. des Sciences de la nature, Laboratoire de Biologie et Cytophysiologie Végétales, 2, rue de la Houssinière, F. 44072 Nantes Cedex, France. Communicated by Liliane Simon.

Below follow abstracts of recent papers from our laboratory.

1. Liliane Simon, Jean-Pierre Bossy*, and Jean-Pierre Garrec*, 1984. Ultrastructural and x-ray microanalytical studies on the association of phosphorus and calcium in metachromatic granules of the hyphae in Aureobasidium pullulans. Physiol. Vég., 22(6):833-839.

*Laboratoire de Biologie végétale, D.R.F., CENG, 85 X, 38041 Grenoble Cedex, France.

Abstract

The repartition of metachromatic granules in the hyphae of a strain of Aureobasidium pullulans cultured in saprophytic conditions was examined in electron microscopy (transmission, scanning). Phosphorus and calcium

accumulation was demonstrated in these granules by x-ray microanalysis. Traces of sulphur were also detected. These results are compared with those obtained on blastospores of the same species.

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2. Etude Ultrastructurale des Differentes Régions de L'Hyphe Chez Aureobasidium pullulans (De Bary) Arnaud. Cryptog.Mycol., 5(4):323-330, 1984.

Summary

This study is an approach to ultrastructural and cytochemical aspects of the various cellular organelles and formations in relation to their location in the hyphae, from the apex to a more distal differentiated zone. Polysaccharides labelling obtained by Thiery test and observations of the different regions have shown the metabolic importance of the subapical zone and a slightly more distal zone ("sous-apicale") where membrane and vacuolar systems are implicated in phagocytic and autophagic functions. An atypical Golgi apparatus made up of single cisternae participates in exocytose functions and is found already in the subapical zone. Bell shaped mitochondria in a slightly more distal zone ("sous-apicale proximale") are folded around an area of cytoplasm in which ribosomes are less numerous but grouped in polysomes. Behind the sub-apical zone the plasmalemmasomes, located in the periplasmic space, have a single lenticular morphology but in the older zones ("sous-apicale en voie de différenciation" and "différenciée") they are represented by plurivesicular structures also located under the wall, or in the cytoplasmic compartments. Lipidic, glycogenic and metachromatic reserves are formed near the sub-apical zone ("sous-apicale proximale"). The hyphal apex is occupied by secretory vesicles derived from enlarged endomembranous profiles where polysaccharides are adsorbed. These results show the very important physiological function of the zone located below the apex ("sous-apicale") and are discussed in relation to other data.

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XXI. ALKO Research Laboratories, P.O. Box 350, SF-001 Helsinki 10, Finland. Communicated by Matti Korhola.

Below follows a list of our recent work published since Professor Suomalainen's last communications.

Dr. Roy S. Tubb, formerly head of Microbiology and Fermentation at the Brewing Research Foundation, Nutfield, England has joined my laboratory as a visiting scientist for the years 1985-86.

1. Kari Suoranta and John Londesborough. 1984. The specificity of Yeast Low-K_m Cyclic AMP Phosphodiesterase Towards Free Bivalent Metal Ions and The Diastereoisomers of Cyclic Adenosine Phosphorothioate. Biochemical Journal 226:897-900.

The relative activity of a zinc-containing cyclic AMP phosphodiesterase towards the (S_p)-compared with the (R_p)-diastereoisomer of cyclic adenosine phosphorothioate varied with the identity of the free

bivalent metal ion from more than 35 to 0.074 along the series $Mg^{2+}>Mn^{2+}>Co^{2+}>Zn^{2+}>Cd^{2+}$, showing that this ion, and not the tightly bound zinc, bonds to the phosphorothioate moiety of the substrate.

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2. E. Väisänen, M. Korhola and M. Turkki. 1984. Determination of the Maximum Growth Temperature of Different Yeasts. Abstract of paper presented at the Kemian Päivät - Finnish Chemistry Days, Symposium on Biotechnology, Espoo, Finland 1984, Kemia-Kemi 11 (1984): 11, Abstracts.

The maximum growth temperature of yeasts is generally 30-40°C. Some strains do grow at higher temperatures, but none is known to grow at 50°C or higher.

During the process of determining a number of characteristics of the strains in our industrial culture collection, a total of 875 yeast strains were screened for their maximum growth temperature. The strains were mainly Saccharomyces cerevisiae strains used as baker's and distiller's yeast together with haploid laboratory strains and 19 other Saccharomyces species, as well as yeasts from 9 other genera.

A temperature gradient incubator with a solidified growth medium was used to determine the maximum growth temperature. The surface of the medium was inoculated and after a suitable incubation period the front of growth was determined by visual inspection and the temperature of the surface at this point was measured. The temperature zone of best growth was evaluated to estimate the optimum growth temperature of the strain. The range of maximum growth temperatures of the yeasts studied was 29.3°C-46.5°C. a S. exiguus strain having the lowest and a Kluyveromyces sp. the highest value. The maximum growth temperature of the S. cerevisiae strains was aroung 40°C, the haploid strains having a slightly lower value (mean 38.9°C) than the baker's (mean 39.9°C) and distiller's (mean 40.5°C) strains. The maximum growth temperatures of S. exiguus (mean 33.1°C), S. lactis (mean 33.1°C), S. pastorianus (mean 33.3°C), Torulopsis versatilis (31.6°C), Torulaspora rosei (33.6°C), and Rhodotorula glutinis (33.5°C) were especially low.

The optimum growth temperature of the strains was generally estimated to be 4-5°C lower than the maximum growth temperature.

* * *

3. The following publication has appeared since the last communications. The abstract of the report has been given in Yeast Newsletter 33 (1984):2,87.

Kari Suoranta, Cyclic AMP phosphodiesterase activities in growing cells of baker's yeast (Saccharomyces cerevisiae) Journal of Cyclic Nucleotide and Protein Phosphorylation Research 10 (1985), 121-127.

* * *

XXII. University of New South Wales, School of Food Technology, Kensington, N.S.W. Australia 2033. Communicated by Graham H. Fleet.

The following paper resulted from a sabbatical leave in France of the senior author.

G.H. Fleet, S. Lafon-Lafourcade', and P. Ribéreau-Gayon', 1984. Evolution of yeasts and lactic acid bacteria during fermentation and storage of Bordeaux wines. Appl. Env. Microbiol. 48(11):1034-1038.

[1]Institut d' Oenologie, University of Bordeaux, 33405, Talence, France.

Abstract

Th levels of yeasts and lactic acid bacteria that naturally developed during the vinification of two red and two white Bordeaux wines were quantitatively examined. Yeasts of the genera Rhodotorula, Pichia, Candida, and Metschnikowia occurred at low levels in freshly extracted grape musts but died off as soon as fermentation commenced. Kloeckera apiculata (Hanseniaspora uvarum), Torulopsis stellata, and Saccharomyces cerevisiae, the dominant yeasts in musts, proliferated to conduct alcoholic fermentation. K. apiculata and eventually T. stellata died off as fermentation progressed, leaving S. cerevisiae as the dominant yeast until the termination of fermentation by the addition of sulfur dioxide. At least two different strains of S. cerevisiae were involved in the fermentation of one of the red wines. Low levels of lactic acid bacteria (Pediococcus cerevisiae, Leuconostoc mesenteroides, and Lactobacillus spp.) were present in grape musts but died off during alcoholic fermentation. The malolactic fermentation developed in both red wines soon after alcoholic fermentation and correlated with the vigorous growth of at least three different strains of Leuconostoc oenos.

* * *

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

This is the summary of a recently published paper:

1. Malík, F., Mecháček, J., Minárik, E. and A. Dobos: Importance of Selected Wine Yeast in Wine Technology. IVth part. Application of Active Dry Wine Yeasts in Czechoslovak Wine Making (in Slovak). Kvasny prumysl (Prague) 30, 1984, Nr. 11, pp. 249-253.

Pilot-plant fermentation experiments of must with different active dry wine yeasts in the vintage 1982 and 1983 have been carried out. The course and results of fermentations realized spontaneously and under regulated conditions documented the advantage of "pure" fermentation pathway. Most wines fermented with pure or mixed yeast starters may be characterized by higher level of alcohol and lower volatile acid and acetaldehyde concentrations. Sensory evaluations of 9 test wines coming from 3 different wineries were all in favor of wines fermented with active dry wine yeast preparations.

* * *

The following is the summary of a paper accepted for publication:

2. Minárik, E., Burdová, K.: Influence of fermentation stimulators on the growth and fermentation rate of some wine yeast species and strains. Kvasny prumysl (Prague) 31, 1985, Nr. 4 (in press).

Different fermentation stimulators were tested on the growth and fermentation activity of some wine yeast species and strains. A preparation of Botrytis cinerea had the most pregnant activation influence on the growth and the first phase of fermentation of must. A more profound fermentation with less residual sugar and lower concentration of volatile acids in the wines were achieved. Thiamine showed only slight stimulating influence, while $(NH_4)_3PO_4$ and urea had no positive influence at all. Technological aspects of this fact are briefly discussed.

* * *

XXIV. Microbiology Department, Abasaheb Garware College, Karve Road, Poona 411 004, India. Communicated by Vinay B. Rale.

Feasibility of Fruit Cannery Waste Utilization For SCP Production in India

India produces a variety of fruits both in temperate and subtropical regions of the country like apple, peach, pear, grape, plums and strawberry, mulberry, oranges, lemons, pineapple, mango, jamun, guave, watermelon, chestnut, banana, etc. All the fruits which are in excess of the day to day needs are converted into soft drinks, squashes, jams, jellies, sauces, etc. Nagpur Orange Grower's Association (NOGA), the biggest cooperative in the country, produces the squash, jelly, and jam. There are a number of canning industries concentrated in areas where a particular fruit is grown in abundance. The demand of canned products in India is on the increase particularly from civil and military hospitals, urban population, and export requirements. The following are some of the countries which figure on the export list: Aden, Saudi Arabia, Sudan, the U K, West Germany, France, Libya, Cyprus, Lebanon, Iraq, Kuwait, Bahrain, and the USSR. Exports of fresh and processed foods have crossed the Rs 600 million mark. However, the industry has its inherent problems like: market demand, raw material supply, management, lack of adequate marketing facilities (i.e., for collection, storage, distribution, lack of consumer education, and sales promotion), inefficient internal management, and inadequate financial resources.

The pulp left behind after the extraction of juices from fruits like mango, citrus, apple, pineapple, etc., is suitable as cattle feed. It is estimated that 8,500 tons of mango pulp, 2,100 tons of green pea pulp, 400 tons of apple pulp, 800 tons of tomato pulp, 3,000 tons of citrus pulp, and 2,100 tons of pineapple pulp besides a number of other fruit and vegetable pulps are available annually. The author is of the strong contention that all such residues can be suitably upgraded with respect to their protein quality and can serve as valuable by-products. This was substantiated in a project undertaken for a large canning complex in North Kanara, District of

the state of Karnataka. It showed that there was distinct possibilities of rearing microbial biomass on effluent pooled from various streams of pineapple canning process.

* * *

Work on the above project and another on the elucidation of improved molybdate agar for the selective isolation of yeasts from tropical fruits has been recently published. Their summaries follow:

> Vinay B. Rale 1984. SCP from pineapple (Ananas sativa Schutt.) cannery effluents. J. Appl. Microbiol. Biotechnol. 19(2):106-109.

Pineapple cannery effluents are available nearly round the year. The effluents are rich in microbially utilizable nutrients and when supplemented with ammonia support good growth of Candida utilis and Hansenula sydowiorum. The latter strain produces 45 g/l, 21.9 g/l, 1.5%, and 6.4% of cell biomass, protein, DNA and RNA, respectively, in batch fermentations of such a medium. Amino acid profile, digestibility, NPU, and actual feed experiments confirm the applicability of the product. Concomitantly, a 90% reduction in BOD_5 value of the effluent can be effected during this process which otherwise proves to be troublesome.

* * *

> V.B. Rale and J.R. Vakil, 1984. A note on an improved molybdate agar for the selective isolation of yeasts from tropical fruits. Journal of Applied Bacteriology 56:409-413.

Molybdate agar was fortified with 0.125% calcium propionate and used for routine isolation and differentiation of a variety of yeasts from mixed floras including large numbers of fungi and actinomycetes inhabiting tropical fruits. The results suggest that this technique could be usefully incorporated in yeast isolation and identification procedures.

* * *

XXV. Meetings

1. Symposium "The expanding realm of yeast-like fungi"

From 3-6 August 1987, the week directly following the international Botanical Congress at Berlin, the Centraalbureau voor Schimmelcultures will host a symposium on the taxonomy and ecology of yeast-like fungi.

Objectives

There is still a wide gap between the methods employed for study of yeasts and of moulds, while it is increasingly realized that at both sides of this "borderline" different parts may be found of the life-cycle of one and the same organism. The confrontation of these dissimilar areas of research opens new horizons, both with respect to fundamental research and to (industrial) application.

Scientific programme

In order to arrive at a balanced programme, there will be invited plenary lectures only. There are three main topics: (1) a taxonomic review of hitherto known yeast-like fungi and related organisms, (2) frontiers of development of a selection of taxonomic methods, and (3) ecology and he species problem. Free poster contributions on the above or related topics are also accepted.

Proceedings

Abstracts of invited papers and of poster contributions will appear in advance in the Journal Antonie van Leeuwenhoek Reports, while full invited papers will later be published by Elsevier Science Publishers.

Language, location

The current language will be English. The symposium will be held at the Hotel Amersfoort, Amersfoort, The Netherlands. The centre is located in a woody area, at a distance of about 50 km from Amsterdam and Schiphol airport, near several highways, and easily accessible by train. The participants will be accommodated at this centre and in nearby hotels. The symposium fee, including meals and modest accommodation, is estimated at Hfl 750,--.

Organizing committee

G.S. de Hoog (Netherlands), M. Th. Smith (Netherlands), A.C.M. Weijman (Netherlands), L.R. Batra (U.S.A.), B. Kendrick (Canada), T. Nakase (Japan), F. Oberwinkler (F.R.G.), J.P. van der Walt (S. Africa).

Secretariat

Correspondence should be addressed to the organisers of the symposium:

G.S. de Hoog and A.C.M. Weijman
Centraalbureau voor Schimmelcultures
P.O. Box 273
3740 AG Baarn
The Netherlands
Tel. 02154-11841

M. Th. Smith
CBS Yeast Division
Julianalaan 67a
2628 BC Delft
The Netherlands
Tel. 015-237894

2. Xth International Specialized Symposium on Yeast Genetics and Molecular Biology, November 4-9, 1985, Varna, Bulgaria.

Organizing Committee

P.V. Venkov (Chairman)
L.I. Stateva (Secretary)
P. Dandanov (Treasurer)
A.A. Hadjiolov
L.V. Waltscheva
N. Nikolaev
V. Kostov
T. Guinova-Stojanova
M. Garabedjan

All correspondence should be addressed to:

Xth I.S.S.Y. Secretariat
Institute of Molecular Biology
Bulgarian Academy of Science
1113 Sofia, Bulgaria
Tel 72 80 50

In accordance with the resolution of the International Commission for Yeasts, the Xth International Specialized Symposium on Yeast Genetics and Molecular Biology will be held in Varna, Bulgaria, 4-9 November, 1985.

The Symposium will be organized by the Institute of Molecular Biology, Bulgarian Academy of Science

Scientific Programme

Scientific sessions will run from the morning of Tuesday 5th, to the evening of Friday 8th November, and will be held in the International House for Scientists "F.J. Curie".

The scientific programme of the Symposium will include 3 sessions: genetics, molecular biology and applications in biotechnology. Contributions concerned with any aspects of these topics are welcome. Each session will consist of lectures, posters, and informal evening workshops. Facilities will be offered for projections of 5/5 cm slides. The detailed programme will be distributed among the participants at the registration desk of the Symposium.

3. Scottish Yeast Group

A day workshop was organized by Dr. Johnny Johnston and held in the University of Strathclyde on April 11, 1985. Forty people were present representing yeast research at the Universities of Edinburgh, Glasgow, Heriot-Watt, St. Andrews and Strathclyde and the companies of Chivas Bros., Distillers Company, Hiram-Walker, Scottish and Newcastle Breweries and Tennent-Caledonian Breweries.

Discussion was organized around the topics of nitrogen metabolism, cell cycle, stability of mRNA, of plasmids and of gene replication in certain genotypes, flocculation and diacetyl formation. A total of 17 short papers were presented by members of the research groups of Drs. Alistair Brown, Ian Dawes, Peter Fantes, Johnny Johnston, Brian Kilbey, Jim Kinghorn and Colin Slaughter. Apologies were received from several other Scottish yeast research workers who were unable to attend.

The day was unanimously voted to be most useful and enjoyable. The formation of an informal Scottish Yeast Group was agreed to be a worthwhile venture. At very little cost it afforded additional opportunity for those working in yeast in Scotland, particularly post-graduate students, to associate and exchange ideas and information.

It was agreed that the Group aim to meet twice yearly but, because of the location of the British Yeast meeting in Glasgow in September, to meet

next Spring, 1986. Dr. Alistair Brown agreed to organize this next meeting in Glasgow. The generous financial sponsorship of the meeting by Chivas Bros. was gratefully acknowledged and it was hoped that other Scottish companies would be willing to offer sponsorship of future meetings.

* * *

I shall be on leave and be working in Robert K. Mortimer's laboratory from July through December of 1985. I would be glad to be contacted there by any yeast scientist. The address is Department of Biophysics, University of California, Berkeley, CA 94720.

John R. Johnston
Department of Bioscience and
Biotechnology
University of Strathclyde
Glasgow G1 1XW, U.K.

4. The XVIth Annual Conference on Yeasts, Cz. Microbiological Society, was held 20-22 February, 1985, in Smolenice Castle. Communicated by A. Kocková-Kratochvílová, Institute of Chemistry, 84238 Bratislava, CSSR.

Minisymposium on Taxonomy, Ecology and Immunology

A. Kocková-Kratochvílová: Recent state of the taxonomy of yeasts and yeast-like organisms.

J. Zemek, Ľ. Kuniak, A. Kocková-Kratochvílová: Glycosidases in yeasts and yeast-like organisms.

J. Augustin, J. Zemek, A. Kocková-Kratochvílová, Ľ. Kuniak: Study of the production of amylolytic enzymes in yeasts and yeast-like organisms.

J. Zámocký, J. Zemek, Š. Kučiar, Ľ. Kuniak: The interaction of anhydrosaccharides and their lipidic derivatives in yeast-like organisms.

A. Matusová: The interaction of yeasts and yeast-like organisms with 1,6-α-glucans.

V. Stollárová: The formation of yeast communities in original and by human influenced ecosytems.

L. Švorcová: The occurrence of yeasts in water of bath facilities.

E. Minárik: Ecology of yeasts forming pellicles in natural habitats in wineries.

A. Tomšíková: Immunological methods in taxonomy of yeasts.

J. Šandula: The use of enzymic immunological tests in taxonomy.

L. Masler: Polysaccharides of yeasts like immunomodulators.

Minisymposium on gene manipulation

V. Vondrejs: The importance of gene engineering in yeast genetics.

J. Šimut: Some aspects in molecular biology of yeasts.

E. Hostínová: Gene manipulation in yeasts by recombination of DNA.

Minisymposium of yeast protoplast fusions

A. Svoboda: Cytology of yeast protoplast fusions.

B. Brzobohatý: The interaction of liposomes with protoplasts of yeasts-like model system of fusing membranes.

B. Janderová: Fusion of protoplasts of industrial yeast strains.

J. Vorišek: The precision of cytological characteristics of glycoprotein secretion pathway in Saccharomyces cerevisiae.

Section 1: Physical and Physico-chemical methods in yeast research

A. Kotyk: The measurement of membrane and surface potentials.

J. Slavík: The measurement of local pH.

J. Plášek: Optical methods in yeast research.

Section 2: The research in biotechnology of yeasts

J. Augustin, E. Šturdík: Biochemical and technological aspects of the fractionation of yeast biomass.

Č. Novotný, B. Běhalová, L. Doležalová, M. Wurst, J. Zajíček: The regulation of the synthesis of $\Delta^{5,7}$ - unsaturated sterols in Saccharomyces cerevisiae.

O. Volfová: The use of yeast-like organisms of the genus Candida in biotechnology of non-traditional substrates.

O. Bendová: The industrial importance of yeasts of the species Saccharomyces cerevisiae.

F. Malík, E. Minárik, G. Vojteková: The importance of dried wine yeasts in the technology of wineries.

A. Vojtková: The utilization of saccharides by yeasts.

Posters

A. Bláhová, J. Buranský, J. Drga: Immunological and biochemical directories after intrapulmonary application of Candida albicans to rabbits.

O. Jungová: Ecology of yeast and yeast-like microorganisms of wine.

A. Kocková-Kratochvilová, E. Sláviková a R. Kovačovská: The survey of yeast genera.

E. Paulovičová, J. Šandula: The detection of precipitates of C. albicans and C. glabrata: comparison of racket immunoelectrophoresis, two-size immunoelectrophoresis and microimmunodiffusion.

V. Pavliak: The study of immunoactive polysaccharides of pathogenic Candidas by the ELISA test.

B. Brzobohatý: The interaction of plasmid DNA with protoplasts of Saccharomyces cerevisiae.

V. Klobučníková: Mutants of Saccharomyces cerevisiae resistant to valinomycin and nigericin.

J. Hašek, J. Svobodová: Microtubular system of postincubated Saccharomyces uvarum.

V. Kováčová, V. Vlčková, D. Brejová: Genetic analysis of lytic revertants (lys2) rad2 strain S. cerevisiae.

V. Vlčková, V. Kováčová: The study of the mutability in strains damage in excise repair system (rad2) in S. cerevisiae.

I. Janatová: The increase of the efficiency of the selection of hybrides by zymocin.

P. Kotal, J. Vernerová, M. Jirsa: The use of yeasts in experimental medicine.

M. Kothera, J. Plášek, V. Vondrejs: The flow cytometer and its application in the determination of the survival of yeasts.

E. Nejedlá, V. Drášil: Comparison of the effects of radiation and of hydrogen peroxide on cells of S. cerevisiae.

R. Špaček, V. Vondrejs: The determination of the activity of zymocins by rhodamine B.

R. Špaček, D. Freharová, V. Vondrejs: A study of zymocin effect by fluorescence microscopy.

J. Augustin, K. Dercová: The detoxification changes of formaldehyde by growing yeast cultures.

J. Čepička, H. Čižková: Relationship between the fermentation grade and metaboic quotients of production brewing yeasts.

M. Havrlíková: The growth of Candida boidinii cells on methanol in a continuous system.

M. Hrmová, M. Vršanská: The ability of an enzyme system of Arthrobacter CJM-1 to lyse yeasts and its characteristics.

Z. Kossaczká, A. Vojtková, E. Machová: The influence of vitamine requirement on growth rate of yeasts.

M. Líšková, V. Farkaš: New media for the screening of microbial producers of cellulases and xylanases.

S. Ohrablo: The autolysis of baker's yeast.

J. Šajbidor, V. Heriban, J. Augustin: The production of organic acids and the analysis of lipidic composition in Candida lipolytica cultivated on n-alkanes.

D. Šmogrovičová, J. Augustín: Utilization of alcohols and fatty acids during yeast growth.

5. The International Union of Microbiological Societies, International Commission on Yeast and Yeast-like Microorganisms.

XIth International Specialized Symposium on Yeasts.

Regulation of Transport and Metabolism in Yeasts
Basic and Biotechnological Aspects

Lisbon, Portugal, 17-21 March 1986
Hosted by the Calouste Gulbenkian Foundation

Corresponding address: Prof. N. van Uden
Gulbenkian Institute of Science
Apartado 14
2781 Oeiras Codex
Portugal

* * *

XXVI. New Journal

A New Quarterly Journal from John Wiley

Announcement and Call for Papers

YEAST

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Further internationally respected experts will be added.

Aims & Scope

YEAST will be an international journal publishing original research articles, review papers and commentaries on the genetics, molecular biology, biochemistry, physiology, cell biology, taxonomy and biotechnology of Saccharomyces and all yeast genera. The journal will also act as a forum for yeast researchers, publishing letters, announcements and reports of meetings of the various informal yeast groups around the world.

Each issue will contain major and minor reviews of important areas of yeast research. Major reviews will usually be invited, but suggestions for contributed minor reviews will be welcomed by the editors. Major reviews will be announced in advance so that original papers in the area of review can be submitted for publication in the same issue.

Please submit all contributions to the editors.

Subscription details: Volume 1, 1985, (2 issues)
UK £25.00. Elsewhere US $49.50.

Special introductory offer, Volume 1 and 2 (6 issues) UK £60.00. Elsewhere US $120.00.

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* * *

XXVII. Obituary

To our great sorrow Professor Heikki Suomalainen passed away on the tenth of January, 1985 at the age of 67. He had been retired from the Finnish State Alcohol Company, Alko Ltd. for almost 3 years even though he actively continued some of his activities at Alko.

Professor Suomalainen earned his Ph.D. in Microbiology in 1948. He worked in Alko for 41 years in various research and production functions and ended up as the director of industrial activities including research. His main research interests were the biochemistry and physiology of baker's yeast and aroma of distilled alcoholic beverages. He was very active in international organizations, including the International

Commission for Yeasts and the International Union of Pure and Applied Chemistry.

Matti Korhola
Alko Dept. of Microbiology

* * *

XXVIII. Brief News Items

1. I have moved from Mitsubishi-Kasei Institute of Life Sciences to the Kumamoto Institute of Technology, Department of Applied Microbial Technology, Ikeda 4-22-1, Kumamoto 860, Japan.

Norio Gunge
Professor of Applied
Microbial Technology

2. I'm retiring from active service at the Miller Brewing Co, Milwaukee, Wisconsin at the end of August, 1985. I plan to do some writing and traveling.

J. Raymond Helbert
P.O. Box 330
Milwaukee, WI 53201-0330

* * *