Y E A S T

A News Letter for Persons Interested in Yeast

November 1964 Volume XIII, Number 2

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Many thanks to those who have contributed to this issue by sending in news items and accounts of research projects. The next issue will be published in May 1965. A contribution of $0.50 from those who have not contributed for some time would be appreciated to finance future editions of the News Letter. Many thanks to those who have contributed recently.

The Editors

The Editor extends to the readers of the Yeast News Letter his warmest wishes for a happy and productive new year ahead.

H. J. Phaff

I. Centraalbureau voor Schimmelcultures, Yeast Division, Julianalaan 67a, Delft, Holland. Communicated by Miss W. Ch. Slooff.

The following cultures, for which a description has been published, have been received by the C.B.S.

Brettanomyces custersii Florenzano
G. Florenzano, Ric. Sci., 20:1494, 1950

Candida berthetii Boidin, Pignal, Mermier et Arpin
J. Boidin, M. G. Pignal, F. Mermier et M. Arpin, Cahiers de la Maboké, 1:86-101, 1963

Chlamydozyma zygota Wickerham
L. J. Wickerham, Mycologia 56:253-266, 1964

Hansenula petersonii Wickerham
L. J. Wickerham, Mycologia 56:398-414, 1964

Metschnikowia bicuspidata (Metschnikoff) Kamienski
L. J. Wickerham, Mycologia 56:253-266, 1964

Metschnikowia kamienskii Spencer, Phaff et Gardner
J. F. T. Spencer, H. J. Phaff and N. R. Gardner, J. of Bact. 88: 758-762, 1964

Pichia salictaria Phaff, Miller et Spencer
H. J. Phaff, M. W. Miller and J. F. T. Spencer, Antonie van Leeuwenhoek 30:132-140, 1964

Pichia trehalophila Phaff, Miller et Spencer
H. J. Phaff, M. W. Miller and J. F. T. Spencer, Antonie van Leeuwenhoek 30:132-140, 1964

Schizosaccharomyces malidevorans Rankine et Fornachon
B. C. Rankine and J. C. M. Fornachon, Antonie van Leeuwenhoek 30: 73-75, 1964

Publications:

N. J. W. Kreger-van Rij, A taxonomic study of the yeast genera Endomycopsis, Pichia and Debaryomyces; thesis Leiden University, 1964.

W. Ch. Slooff, Mating types in Pichia membranaefaciens; Antonie van Leeuwenhoek 30:129-131, 1964

II. Dr. N. J. W. Kreger-van Rij (Oosterweg 98E, Haren (Gr.), Holland), has sent the Editor a copy of her doctoral dissertation. With her approval, the Editor presents an abbreviated form of the Summary for the benefit of the readers interested in yeast taxonomy. It should be noted that copies of the dissertation are not available for general distribution. Details will be published in a new edition of "The Yeasts".

SUMMARY

This thesis contains a revision of the classification of the genera Endomycopsis, Pichia and Debaryomyces. Starting point of the investigation was "The Yeasts" by J. Lodder and N. J. W. Kreger-van Rij (1952).

In Chapter 1, the characters used for the description of the yeast species are mentioned. New features are: growth in vitamin-free medium, growth on 50% (w/w) glucose-yeast extract-agar, and growth at 37°C.

While in "The Yeasts" the assimilation of 5 sugars was tested, 31 carbon compounds have been used for the assimilation tests in the present investigation.

Under the heading "Sporulation", we have occasionally recorded whether or not single spore cultures could sporulate again. A description of ultra-thin sections of spores as observed under the electron microscope has been given for several species.

In Chapter 2, the nature of the characteristics and their taxonomic value is briefly discussed. Examples are given of their use in the genera studied. More attention is devoted to the important feature "Sporulation".

In Chapter 3, the genus Endomycopsis is discussed. A diagnosis of the genus is given. It agrees with that given in "The Yeasts", with one exception: arthrospores may be formed.

The 51 strains studied have been classified in 11 species. Five of the latter had already been accepted in "The Yeasts", namely: E. capsularis, E. fibuligera, E. javanensis, E. bispora and E. selenospora.

In contrast to Wickerham's classification, the nitrate-positive species E. bispora is retained in the genus Endomycopsis.

Endomycopsis monospora, originally described by Saito, and indicated in "The Yeasts" as E. fibuligera var. monospora, is again accepted as a separate species.

Endomyces ovetensis is classified in the genus Endomycopsis and E. ovetensis. In the original strain of Trichosporon sericeum spores were found; this form could be identified as E. ovetensis.

E. chodatii is the perfect form of a number of asporogenous species namely: Monilia variabilis, Dematium chodati, Sporotrichum anglicum, Trichosporon behrendii, and, probably, Sporotrichum carougeaui.

New species since 1952 are: E. fasciculata, E. platypodis and E. vini.

The species of the so-called guilliermondii-group, some of which form some true mycelium, have been transferred from the genus Endomycopsis, to which they had originally been assigned, to the genus Pichia.

We have not accepted the genus Prosaccharomyces, described by Novak and Zsolt for the species E. capsularis.

Neither did we recognize the transfer of the species E. javanensis as the genera Endomyces or Schizosaccharomyces.

A key to the species of the genus has been given.

The type species of this genus is E. capsularis.

Chapter 4 contains the discussion of the genus Pichia.

The diagnosis of this genus agrees with that given in "The Yeasts" with Phaff's amendment. As a consequence of the latter, species which do not form a pellicle on malt extract, and which do not produce pseudomycelium, are also accepted in this genus. In the present diagnosis, we have stressed the absence of warts on the spores, in order to be able to distinguish between the genera Pichia and Debaryomyces.

The 220 strains studied have been classified in 29 species and one variety.

Four of these species have previously been described in "The Yeasts", namely: P. membranaefaciens, P. farinosa, P. polymorpha and P. fermentans.

The species P. silvestris, P. indica and P. saccharophila, described after 1952, could be classified as P. membranaefaciens. The species Mycoderma vanlaeriana and M. vinilafarii, described in "The Yeasts" as synonyms of Candida mycoderma, have also been identified as P. membranaefaciens, since they could be mated with one of the types of this species.

The species P. farinosa now includes the following synonyms: P. miso, P. mogii, P. sake, P. farinosa var. japonica and P. minuscula.

P. kluyveri, in "The Yeasts" a synonym of P. fermentans, is again described as a separate species.

The Debaryomyces species, Deb. vini, Deb. fluxorum, and Deb. toletanus have been transferred to the genus Pichia. P. carsonii appeared to be identical with P. vini.

Endomycopsis ohmeri and its variety minor, E. wickerhamii, E. scolyti and E. guilliermondii have been classified in the genus Pichia.

P. rhodanensis includes E. balearica and E. fibuligera var energica.

The species, classified in the genera Petasospora, Zygowillia, Zymopichia and Issatchenkia, could be transferred to the genus Pichia.

We have not accepted the classification of P. terricola, P. polymorpha and P. pseudopolymorpha in the genus Saccharomyces.

A key to the species of the genus Pichia has been given.

P. membranaefaciens is the type species of the genus.

In Chapter 5 the genus Debaryomyces is discussed.

A diagnosis of the genus is given. It agrees with Klöcker's original description of the genus. An amendment to this diagnosis, proposed in "The Yeasts", by which the vigorously fermenting species were excluded from the genus, has not been accepted. Wartiness of the spore wall is an important feature of this genus, distinguishing it from the genera Pichia and Saccharomyces.

The 67 strains studied have been classified in 10 species. Of the 5 Debaryomyces species described in "The Yeasts", only one has remained, namely Deb. hansenii. Deb. kloeckeri, Deb. subglobosus and Deb. nicotianae are considered to be synonyms of Deb. hansenii. The fifth species, Deb. vini, has been transferred to the genus Pichia.

Other new synonyms included in Deb. hansenii are: Deb. miso, Deb. japonicus, Deb. fukuyamaensis and Paratorulopsis banheggii.

Pichia vanrijii, also described as Azymomyces vanrijii, has been transferred to the genus Debaryomyces. Deb. konokotinae appeared to be identical with this species.

Deb. franciscae has originally been described as Torulaspora franciscae.

We have not accepted the genus Zymodebaryomyces for fermenting species.

Other new Debaryomyces species described since 1952 are: Deb. tamarii, Deb. marama, Deb. castellii, Deb. coudertii, Deb. cantarellii and Deb. phaffii.

A key to the species of the genus Debaryomyces and a combined key to the genera Debaryomyces and Pichia have been given.

Deb. globosus is the type species of the genus Debaryomyces.

III. University of Miami - School of Medicine, 1600 N.W. 10th Ave., Miami, Florida 33136. Communicated by Dr. Donald G. Ahearn.

The following is an abstract of Dr. Ahearn's recent Ph.D. dissertation:

"A COMPARATIVE PHYSIOLOGICAL AND MORPHOLOGICAL STUDY OF TERRESTRIAL AND MARINE-OCCURRING CAROTENOGENIC YEASTS" (Supervisor: Dr. Frank J. Roth, Jr.)

Carotenogenic yeasts, particularly of the genus Rhodotorula, were found to be of widespread occurrence in subtropical marine environments. Yeast populations exceeding 5,000 cells/L of sea water were found both in inshore areas and in pelagic regions remote from land and direct extramarine influence. Red yeasts were shown to occur at depths to 4,500 meters. The distribution of species appeared to indicate an interrelationship of the metabolic capacities of the yeasts with the physical-chemical nature of the different marine environments studied. Critical comparison of the marine-occurring forms to related terrestrial ones as regarding growth factor requirements, oxidative capacities, carbohydrate and nitrogen assimilatory abilities, salinity tolerances, and morphology failed to provide irrevocable evidence of indigenous marine forms.

The oxidative metabolism of strains with divergent growth-temperature ranges was examined. Strains of the Rh. infirmo-miniata complex were shown to possess respiratory and growth characteristics typical of psychrotrophic organisms. Apparent nitrogen fixation capacities of selected strains were examined and discussed.

The systematics of the Rhodotoruloideae were critically analyzed and revised. The type cultures of this subfamily of yeasts were reexamined to provide a valid taxonomic foundation for the future identification of marine-occurring strains. The techniques employed in the physiological classification of species were modified and standardized. The delimitation of species employed an expanded number of physiological tests, including the synthesis of iodophilic polysaccharides, capacity to assimilate over 30 carbon and nitrogen compounds, requirements for vitamins, cardinal growth temperatures, and lipolytic activities. Unique morphological properties of the genus were illustrated with photomicrographs.

IV. Muséum National d'Histoire Naturelle, Parc Zoologique de Paris, 53 Avenue de Saint-Maurice, Paris (12). Communicated by Dr. Henri Saëz.

Since the last News Letter the following publications have appeared from this laboratory.

Sur la présence d'une levure, Candida tropicalis (Cast.) Berkhout chez Ixodes ricinus L. (in collaboration with Marc André). Annales de Médecine Vétérinaire, F.3, T.108, pp. 139-145, 1964.

In the ingested blood of a female tick, which parasitized a European deer, we have found numerous blastospores. Culturing of this material gave colonies representing an almost pure culture of Candida tropicalis.

Geotrichum vanrijii nouvelle espèce de champignon arthrosporé isolé chez une Sarcelle d'été (Anas querquedula L.). Bulletin mensuel de la Société Linnéenne de Lyon, 33, 263-267, 1964.

This species is morphologically different from other species of Geotrichum. Physiologically it utilizes only glucose and lactose (the latter slowly) of the classical sugars used in taxonomy.

Action de la température sur le développement in vitro de quelques espèces de Geotrichum. Revue de Pathologie comparée, 64, TI-6-759, 299-301, June 1964.

V. Institute of Microbiology, U.S.S.R. Academy of Sciences, Dept. of Type Cultures of Microorganisms, Moscow, U.S.S.R. Communicated by Professor V. I. Kudriavzev, Director.

In 1958 a new Department of Type Cultures of Microorganisms was set up in the Institute of Microbiology of the U.S.S.R. Academy of Sciences with the aim to organize the U.S.S.R. All-Union Collection of Type Cultures of species and subspecies of filamentous fungi, yeasts, bacteria, and actinomyces non-pathogenic for man and animals.

Professor Kudriavzev has sent the Editor a new catalogue of type cultures. Parts of the preface of the catalogue dealing with yeasts is reproduced for the benefit of our readers.

For the period elapsed, we have collected data on the majority of cultures which are being maintained in the microbiological institutions of the U.S.S.R., have selected those of them whose taxonomic diagnoses raise no doubt, and have compiled a summary Catalogue of these cultures.

The present Catalogue of microorganisms, however, is not complete, since some of the local collections in the U.S.S.R. have not been registered yet. Moreover, the diagnoses of the cultures collected have not been checked by us as yet. Nevertheless a decision was made to publish the list compiled, so as to make the available cultures a common property and thereby to fulfill the first stage of the organization of the All-Union Collection of Microorganisms.

All the microorganisms included in the Catalogue are arranged in alphabetic order of the first letters of Latin names of the big groups: Actinomycetes, Eubacteria, Fungi and Saccharomycetales (Yeasts), and of genera with species within them.

The Catalogue contains the names of species by which the given cultures are stored and maintained in corresponding Institutes in this country or in collections abroad.

In a number of cases, alongside with the obsolete systematic names of cultures new names, accompanied by a sign ©M are also given, as well as the reference to the monograph where their synonyms are defined. New names are repeatedly included into the Catalogue in alphabetic order. The monographs used included the following:

Saccharomycetales:

Ascosporogenous yeasts

V. I. Kudriavzev (abbr. Kudr.) "Taxonomy of Yeasts". M., 1954.
W. I. Kudrjawzew (abbr. Kudr.) "Die Systematik der Hefen". Berlin, 1960.

Asporogenous yeasts

J. Lodder and N. J. W. Kreger-van Rij (abbr. L. and Kr.) "The Yeasts", Amsterdam, 1952.

The names of species accompanied by the names of their authors, are followed--in brackets--by the names of substrates and geographical points from where the strains were isolated, as far as the compilers of the Catalogue could know. All the information about strains is supplemented by abbreviated names of the institutions (on the right side) where the particular strains are being maintained.

The strains obtained from abroad are accompanied (in brackets) by an abbreviated name of the corresponding collection and the number of strain by which it is registered therein.

List of the abbreviated names of collections and addresses of Soviet collections are given in a separate list immediately following the Preface.

Any institution in this country may obtain cultures listed in the Catalogue by applying directly to the Institutions where the particular cultures are being maintained.

In order to avoid unnecessary complications connected with numerous addresses of Soviet institutions, foreign scientists are recommended to direct their applications for obtaining cultures to the Department of Type Cultures, Institute of Microbiology, U.S.S.R. Academy of Sciences, U.S.S.R., Moskow, B-133, Profsouznaya str., 7a.

All cultures, in any quantity, are supplied free of charge.

The Department makes a request to all scientists, both in this country and abroad, to send to our address cultures of newly described species for conservation together with the reprints of papers where these cultures are described. It is desirable that several strains of the same species, especially those isolated from various substrates, should be supplied.

The present Catalogue of cultures was composed in the Department of type cultures basing on the material of corresponding institutions.

Below are the names of the compilers of the Catalogue: L. A. Belyakova (Fungi); V. D. Kuznetsov (Actinomycetales), I. E. Lomova and M. V. Fateyeva (Saccharomycetales), and I. M. Nadirova (Mycobacteriales, Coccales and Eubacteria).

All comments, remarks, and recommendations connected with the organization of the U.S.S.R. All-Union Collection of Microorganisms and the publication of the present Catalogue as well as on the cultures received will be welcomed gratefully and should be sent to the Department.

VI. Southern Illinois University, Carbondale, Illinois. Communicated by Dr. C. C. Lindegren.

The following articles have been published since the last issue of the Yeast News Letter:

Hwang, Y. L., Lindegren, G. and Lindegren, C. C. The twelfth chromosome of Saccharomyces. Canadian Journal of Genetics and Cytology 6: 373-380 (1964).

Lindegren, C. C. and Bang, Y. N. The origin from mitochondria of the double-walled viral membrane in Saccharomyces. Nature 203: 431 (1964).

Hwang, D. S. and Lindegren, C. C. The palatinose element of the receptor of the melezitose locus in Saccharomyces. Nature 203: 791 (1964).

Lindegren, C. C. A new theory to explain crossing over between genes on chromosomes. Nature 204: 322 (1964).

Hwang, Y. L., Lindegren, G. and Lindegren, C. C. Nonrandom assortment in Saccharomyces. Abstract. 15th Annual American Institute of Biological Sciences, Boulder, Colo. (Aug. 23-28, 1964) Genetics 50: 258 (1964).

Bowers, W. D., Jr., and McClary, D. O. Mechanism of bud formation in Saccharomyces cerevisiae. Abstract, The Journal of Cell Biology 23: 12A (1964).

VII. Department of Bacteriology, Indiana University, Bloomington, Indiana. Communicated by Dr. Thomas D. Brock.

Enzyme synthesis during conjugation in the yeast Hansenula wingei

In Hansenula wingei a strong attraction between mating types ensures a highly efficient conjugation process, in which fusion of adjacent cells of complementary type occurs through the dissolution of the cell wall material between them. By the use of amino acid analogs and the antibiotic cycloheximide, I have shown (Brock, T. D., 1961, J. Gen. Microbiol. 26, 487) that new protein synthesis is necessary before conjugation can occur, even though conjugation will occur in a medium in which no budding and little net protein synthesis take place, and that both mating types must be able to synthesize protein to elicit conjugation. The rigid cell wall structure of yeasts is a β-1, 3-glucan with occasional β-1, 6-glycosidic linkages. In H. wingei and other yeasts, I have demonstrated intracellular enzyme activity against both of these linkages, using purified laminarin (a β-1, 3-glucan) and pustulan (a β-1, 6-glucan) as substrates. The presence of these activities in the non-conjugating cell is presumably because of their involvement in the budding process. However, during conjugation in H. wingei both enzyme activities rise sharply, while at the same time another enzyme, acid phosphatase, remains constant in activity. Thus at least one requirement for cell fusion may be the prior synthesis in each strain of cell wall-digesting enzyme in response to the presence of the opposite mating type. Supported by a research grant from the National Science Foundation. U.S.P.H.S. Research Career Development Awardee.

Presented at the Annual Meeting of the American Society for Cell Biology, November 13, 1964. To appear in Journal of Cell Biology, Volume 23, No. 2, p. 15A, 1964.

VIII. Arthur Guinness Son & Company, Park Royal Brewery, London, N.W. 10, England. Communicated by Dr. J. S. Pierce.

Summary from "Absorption of Amino Acids from Wort by Yeasts" by Margaret Jones and John S. Pierce. J. Inst. Brew. 70, 307, 1964.

"The absorption of α-amino acids from wort by various strains of yeast followed a sequence which was almost independent of the conditions employed. The rate of absorption of arginine varied with the strain of yeast employed. The absorption of tryptophan and glutamic acid was affected by aeration. Proline, unabsorbed under 'anaerobic' conditions was taken up during the latter part of the fermentation under aerobic conditions, and absorption was accompanied by the excretion of ninhydrin-positive material as yet unidentified. The use of worts containing an amino acid concentration in excess of a certain maximum resulted in the production of beers containing appreciable concentrations of the less readily assimilable α-amino acids."

Summary from "Comparative Studies on the Dissimilation of Reserve Carbohydrate in Four Strains of Saccharomyces cerevisiae" by V. E. Chester. Biochem. J. 92, 318, 1964.

"It has been shown that a brewing strain of Saccharomyces cerevisiae accumulated large quantities of reserve carbohydrate during anaerobic growth (Chester, 1963a). During harvesting, contact with oxygen initiated the breakdown of a large proportion of these reserves. Evidence was also presented that the yeast reserves provided a sufficient energy source for the synthesis of respiratory enzymes.during the aeration of anaerobically grown resting cells.

Chester (1961) compared baking and brewing strains of Saccharomyces cerevisiae, and reported that in anaerobically grown baking yeast the carbohydrate breakdown after harvesting was relatively much less than in the brewing yeast grown under the same conditions, and that the breakdown was not stimulated by oxygen.

The present paper compared the ability of a number of strains of yeast to accumulate reserve carbohydrate during anaerobic growth and describes the effect of partial pressure of oxygen on the breakdown of these reserves in washed-cell suspensions. The yeasts are also compared with respect to respiratory adaptation and the effect of partial pressure of oxygen on this adaptation."

IX. Department of Food Science and Technology, University of California, Davis, Calif. 95616. Communicated by Drs. M. J. Lewis and H. J. Phaff.

A paper entitled "Glycine assimilation and the Stickland mechanism in brewer's yeast" has recently been accepted by the Journal of the Institute of Brewing. The paper is co-authored by M. J. Lewis and C. Rainbow. Dr. Rainbow, formerly at the University of Birmingham, England, is now with Messrs. Bass Ratcliff and Gretton, Burton-on-Trent, England.

The paper consists of a reexamination of some of the evidence presented by R. S. W. Thorne to support the operation of the Stickland mechanism in yeast. This mechanism consists of a mutual oxidation-reduction reaction

between two suitable amino acids with the release of ammonia; it is well established in certain obligate anaerobic bacteria. The evidence in yeast has hitherto consisted mainly of the observation of enhanced growth of yeast on certain pairs of amino acids. In the work reported in this paper such enhancements were observed only when glycine-containing binary mixtures of amino acids were presented to Saccharomyces cerevisiae in media deficient in pyridoxine and thiamine. Evidence is presented to show that enhanced growth of yeast is the result of adaptation to utilize glycine nitrogen. The non-glycine component of the mixture of amino acids supports yeast growth during the period of adaptation. Thus the participation of glycine in supporting enhanced growth of yeast is independent of a Stickland interaction between the two amino acids. Enhanced growth of yeast is therefore not regarded as sufficient evidence to support the occurrence of the Stickland reaction, which, in the absence of positive evidence, should be considered not operative in S. cerevisiae.

A second paper, co-authored by M. J. Lewis and H. J. Phaff will appear in the April issue of the Journal of Bacteriology. It is entitled "Release of nitrogenous substances by brewer's yeast. IV. Energetics in shock excretion of amino acids".

ABSTRACT

When suitably grown yeast cells are suspended in a solution of fermentable sugar, amino acids from the internal pool are rapidly released from the cells, a phenomenon referred to as shock excretion. After approximately two to three hours, in the presence of excess sugar, the amino acids are almost completely reabsorbed. This observation has been further studied with particular reference to the energy-yielding reactions of the cell. It has been established that amino acid release increases more rapidly with a rise in incubation temperature than does fermentation rate. Amino acid release cannot be inhibited by the common uncouplers of ATP synthesis (azide, arsenate or 2,4-dinitrophenol) at concentrations adequate to prevent reabsorption of amino acids--an energy-requiring event. Inhibitors which completely inhibit the dissimilation of glucose (such as iodoacetate and fluoride) or those preventing entry of glucose into the cell (uranyl acetate) are effective in preventing amino acid release. It was concluded that shock excretion of amino acids is independent of energy-yielding reactions, but may be the result of changes in the state of the cell contingent upon the continuous flow of a fermentable sugar across the cell membrane.

Dr. M. W. Miller of this department left December 1, 1964 for a 7-months sabbatic leave which he is spending at the Division of Food Preservation, C.S.I.R.O., P. O. Box 43, Ryde, N.S.W., Australia. Besides his work in the area of Food Science, Dr. Miller hopes to continue ecological studies of yeasts associated with tree exudates and insects.

Dr. H. J. Phaff spent three days at the University of Miami during November to discuss the taxonomy of the genera Rhodotorula and Cryptococcus with Dr. F. J. Roth, Jr., Dr. Ahearn and Mr. Fell.

X. Department of Industrial Chemistry, Faculty of Engineering, Kyoto University, Japan. Communicated by Dr. Yoshio Tani.

The following paper was recently published:

Physiological and Biochemical Studies on Saccharomyces sake. (III) Decrease of NAD, CoA, Cytochrome C and Several B-Vitamins Contents in the Cells of Saccharomyces sake Grown Anaerobically on a Medium Containing Lactic Acid. Yoshio Tani, Kazushige Sumino, Mitsuo Shimoide and Saburo Fukui. Journal of Fermentation Technology 42, 599-606, 1964.

In a previous paper the occurrence of coagulation and increase of the ratio of dead cells were observed when Saccharomyces sake was cultured statically in a synthetic medium containing lactic acid. This phenomenon is apparently analogous to the so-called "unbalanced growth" of inositol-requiring yeast caused by the deficiency of the vitamin. In this case the amount of bound inositol in the yeast cells was significantly lowered as the concentration of lactic acid increased.

This paper deals with the marked reduction caused by the acid in the NAD, CoA and cytochrome C contents of the yeast cells. The decrease of these coenzymes was similarly observed by Ridgeway and Douglas in the case of the inositol-deficient cells exhibiting "unbalanced growth".

The decrease of several B-vitamins, such as thiamine, riboflavine and pantothenic acid, was also ascertained in the cells grown in the presence of lactic acid. Furthermore, lactic acid stimulated disappearance of inositol exogenously added during the cultivation of Sacch. sake.

From these results it is supposed that lactic acid blocks the transformation of inositol to its bound-form, e.g. phospholipid inositol, and causes the destruction of the structure of cytoplasma granules and phospholipid-enzyme protein complex participating in the respiratory system.

Brief News Items

1. At the time when the May issue of the Yeast News Letter was published notice of the decease of Professor Winge had not yet been received. The Editor announces with deep regret that Professor Øjvind Winge died on April 5, 1964. He was head of the Carlsberg Laboratory's Physiological Department from 1933 to 1956, after which he retired. The brilliant contributions which he and his collaborators have made to the genetics of yeast, higher plants and animals are so widely recognized that they will not be detailed here.

2. Dr. Beryl L. Brady, formerly with the Brewing Industry Research Foundation, Nutfield, England, is now working at the Departamento Microbiologia, Botanical Institute, University of Lisbon, Portugal. She would be interested to receive any reports or cultures of psychrophilic yeasts from workers who may come across these organisms in the course of their studies.

3. Professor J. Boidin, University of Lyon, France writes that they had the pleasure of a visit in their laboratory from Dr. K. Kodama, Iitagawa, Japan. Discussions were held on electron microscopy and on the importance of the morphology of ascospores in yeast taxonomy.

4. Dr. N. van Uden (Dept. of Microbiology, Botanical Institute, University of Lisbon, Lisbon, Portugal) is preparing for the first volume of "Advances in Marine Microbiology" (Academic Press) a review on marine yeasts (taxonomy, ecology, physiology, etc).

For this purpose he would appreciate receiving reprints of recent papers as well as copies of dissertations, on topics more or less pertinent to the subject. Any information on current work or recent publications in this field will be most welcome.

5. Dr. J. F. T. Spencer, Prairie Regional Laboratory, Saskatoon, Sask., Canada, writes:

The following is a progress report of a study by J. F. T. Spencer, G. A. Hobbs and D. A. Cooke.

Yeasts were isolated from honey collected from bumble-bee nests near Pincher Creek, Alberta, and Melfort, Saskatchewan. Out of 137 cultures isolated, 4 were tentatively identified as Chlamydozyma zygota, 24 as Saccharomyces rouxii, and most of the rest as Torulopsis sp., which produces hydroxy fatty acid glycosides of sophorose. The remaining cultures were cultures of Torulopsis sp., and two smuts.

The following two papers which were reported as "in press" and "submitted for publication", respectively, in the last issue of the News Letter have now been published. (For summaries see Yeast News Letter, May, 1964).

The Structures of Galactosyl-Lactose and Galactobiosyl-Lactose Produced from Lactose by Sporobolomyces singularis. P. A. J. Gorin, J. F. T. Spencer, and H. J. Phaff. Canadian Journal of Chemistry 42, 1341 (1964).

The Synthesis of β-Galacto- and β-Gluco-Pyranosyl Disaccharides by Sporobolomyces singularis. P. A. J. Gorin, J. F. T. Spencer, and H. J. Phaff. Canadian Journal of Chemistry 42, 2307 (1964).

6. Dr. V. P. Cirillo writes that he has left the Department of Microbiology, Seton Hall College of Medicine and Dentistry, Jersey City, N. J., and he has now joined the faculty of the State University of New York at its new Stony Brook Campus (Stony Brook, Long Island, New York) in the Dept. of Biological Sciences. Dr. Cirillo is continuing his work on membrane transport in yeast and other microorganisms. Qualified graduate students interested in this field are encouraged to write Dr. Cirillo.

The following paper has been published:

Action of the Polyene Antibiotics Filipin, Nystatin and n-Acetylcandidin on the Yeast Cell Membrane. V. P. Cirillo, Mary Harsch and J. O. Lampen. J. Gen. Microbiol. 35, 249 (1964).

7. Dr. Frank H. Stodola, Principal Scientist, Pioneering Laboratory for Microbiological Chemistry, U.S.D.A., Northern Utilization Research and Development Division, 1815 North University Street, Peoria, Illinois 61604, writes:

I am enclosing an announcement regarding Resident Research Associateships for Postdoctorates for 1965-1966. These associateships, supported by the Agricultural Research Service, provide young scientists of unusual ability an opportunity for advanced training and basic research in the biological and physical sciences.

Opportunities provided by our Pioneering Research Laboratory for Microbiological Chemistry, which is located in the Northern Utilization Research

and Development Division, Peoria, Illinois, are in the following areas:

Biosynthetic pathways in microbiological synthesis: (Dr. Frank H. Stodola)

Research on isolation and structure determination of new microbial products; intermediary metabolism, biosynthetic pathways, and control mechanisms; and relationship of cell structure to cell function. Current research deals with extracellular lipids, ramulosin, and avenaciolide; bacterial oxidation of carbohydrates; immunochemistry and enzymology of bacterial chromatophores; and biophysics of sexual agglutination in yeasts.

I should appreciate your passing this information on to eligible postdoctorates who meet the qualifications set forth in the leaflet. Application blanks may be obtained from the Fellowship Office, National Academy of Sciences-National Research Council, 2101 Constitution Avenue, Washington, D.C. 20418.