

**NATIONAL COLLECTION OF
INDUSTRIAL MICRO-ORGANISMS
(NCIM)**

(Council of Scientific & Industrial Research, New Delhi)

A NATIONAL FACILITY

CATALOGUE OF STRAINS,

ALGAE,

BACTERIA,

FUNGI

&

YEASTS

**CSIR-NATIONAL CHEMICAL LABORATORY
PUNE – 411008**

2014

Telephone : 91-20-25902670
Fax : 91-20-25902671
E-mail : ncim@ncl.res.in
Please visit us at : www.ncl-india.org/ncim

NCIM Catalogue of Strains

First Edition 1977

Second Edition 1997

Third Edition 2004

Fourth Edition 2014

© 2014 CSIR-NATIONAL CHEMICAL LABORATORY (NCL)

**No Part of this publication may be reproduced without the permission of
the Director, NCL**

Published by : Dr. S. Pal
Director NCL, Pune

Printed by : Sneha Printers
Pimple Gurav,
Pune – 411 027

PREFACE

National Collection of Industrial Microorganisms (NCIM) is a national facility dedicated to isolation, preservation, distribution of authentic cultures and identification. It was established in 1951 and operates as a dedicated Resource Centre in the National Chemical Laboratory (NCL). Starting with just 400 cultures, the NCIM holds 3700 cultures today.

Culture collections play an important role in the area of biotechnology. But their meaningful exploitation is possible only if the properties of cultures are properly documented and the information is easily accessible. I am very happy that the NCIM Catalogue is ready with the latest information about the cultures housed at NCL.

All researchers in the field can help in building up the culture collection by depositing cultures that have scientific and industrial value. NCIM is fully geared to help scientists to exploit the rich biodiversity of this country for the benefit of the common man.

I appeal to everyone to come forward and deposit new cultures in NCIM, thus adding to the wealth that can be shared by a large number of users.

*S. Pal
Director, NCL, Pune
February 2014*

CONTENTS

- 1.0 National Collection of Industrial Microorganisms (NCIM)**
 - 1.1 Functions
 - 1.2 Deposit of culture
 - 1.3 Distribution of cultures
 - 1.4 Patent cultures
 - 1.5 Other services
- 2.0 NCIM Catalogue**
 - 2.1 Arrangement of strain data
 - 2.2 General information
 - 2.3 Acknowledgement
 - 2.4 List of abbreviations
- 3.0 Catalogue of strains**
 - 3.1 Algae
 - 3.2 Bacteria
 - 3.3 Fungi
 - 3.4 Yeasts
- 4.0 Media formulations**
- 5.0 Strains with special applications**
 - 5.1 Bacteria
 - 5.2 Fungi
 - 5.3 Yeasts
- 6.0 Numerical index**
 - 6.1 Algae and Bacteria
 - 6.2 Fungi
 - 6.3 Yeasts

**NATIONAL COLLECTION OF INDUSTRIAL MICROORGANISMS
(NCIM)**

Head : Dr. J. M. Khire

Scientists : Dr. Mahesh Dharne
Dr. Syed Dastager

Technical Staff : Mrs. S. S. Sudge
Mr. S. K. Roy Choudhuri
Dr. S.M. Kotwal
Mrs. Shalaka Gaikawaiari
Mrs. Shivani Chaudhari
Mrs. Ratnamala Valvi

1.0 INTRODUCTION

At the suggestions of Dr. S.S. Bhatnagar, Director, Council of Scientific and Industrial Research India, "The National Collection of Type Cultures" (NCTC) was started in 1941 at the Indian Institute of Science, Bangalore, under the direction of Prof. M. Sreenivasaya.

In 1951, the culture collection was transferred to the then Biochemistry Division of the National Chemical Laboratory, Pune, under the direction of Dr. M. Damodaran. In 1956, it was decided that the culture collection will maintain only organisms of value to research and industry and hence the name was changed from NCTC to National Collection of Industrial Microorganisms (NCIM). NCIM was designated as a Resource Centre of NCL in 2002. NCIM consists of around 3700 strains of algae, bacteria, fungi and yeast. Only nonpathogenic cultures are maintained in the collection. NCIM is one of the largest culture collections in India and is a member of World Federation for Culture Collections (WFCC).

1.1 FUNCTIONS

The primary function of NCIM is to maintain cultures of algae, bacteria, fungi and yeast of scientific and industrial interest and supply them to industrial, research and educational establishments.

1.2 DEPOSIT OF CULTURES

Researchers wishing to deposit cultures are requested to adopt the following procedures:

- (i) The depositor should contact Head, NCIM Resource Centre before dispatching the culture.
- (ii) "Deposition Form" should be completed by the depositor giving all the detail information regarding the culture.

The cultures would be made available to them as and when they are required.

While every endeavour would be made to ensure that the cultures are maintained, no guarantee can be given for the continuous maintenance of a given strain.

Upon acceptance of the culture in NCIM, a unique accession number will be allotted to the strain. The depositor will be informed of the accession number while acknowledgement of the culture. The accession number must be quoted for all future reference.



NCIM Resource Center

CSIR-National Chemical Laboratory
Pune, 411008, INDIA
<http://www.ncl-india.org/>



A National facility established in 1951

ACCESSION FORM FOR GENERAL DEPOSIT OF MICROBIAL STRAIN

Deposit of – **Bacteria/ Fungi/ Yeasts/ Algae/ Others-**

I] Depositor's information

Name of depositor Prof./Dr./Mr./Mrs.			
Address of depositor (Official)			
Contact information	Tel, Mobile	Fax	Email
Isolated by (Person)			
Isolated on (mm/dd/yyyy)-			
Received from* (Name, address)	*Applicable, only if strain is received from outside of the depositor's lab		

II] Strain origin and history

Details	Genus	Species (sub-species/variety)
Strain designation e.g. <i>Bacillus megaterium</i>		
Gram's nature, shape (For bacteria)		
Other strain designations or collection numbers other than NCIM; Yes or NO	If yes, then mention the accession number (s) (e.g. ATCC 1234)	
Risk group/Biosafety level 1 or 2	If not sure then use search engines.	
Convention on Biological Diversity (CBD) related information (Compulsory) http://www.cbd.int for details	Sampling agreement- Prior Informed Consent (PIC): Yes/No/Not applicable (Underline correct option) Organization/Authority who issued PIC: NCIM cannot accept a culture without this information.	
Source and geography (place, state)		
Country of origin		

III] Recommended conditions for cultivation

Growth/Maintenance medium or media (name and composition) Please attach separate sheet, if needed	
pH of medium	
Temperature for growth (°C)	
Aerobic/anaerobic/ micro-aerophilic	
Incubation period (hrs)	
Tentative sub-culturing period (days)	
BIOCHEMICAL PERFORMANCE/Potential	
Reference if any –	

IV] Strain identification information (please attached additional sheet, if needed)

Please tick mark or round mark the following. If not relevant- If not relevant- don't mark.

1. Specific use (antimicrobial agents, bioassays, Quality control, teaching etc.)
2. SSU or LSU rRNA Sequence for this strain is provided with this sheet?-- Yes or NO
3. Genebank/NCBI/EMBL/DDBJ accession number-(if known)-
4. If sequence not yet deposited- then please submit raw sequence (use separate sheet).
5. Biochemical tests, sugar assimilation data by API/Vitek/ Biolog/etc.
6. MIDI system based similarity index (Optional)-
7. Any other special application.

AGREEMENT FOR DEPOSIT IN PUBLIC COLLECTION

It is certified that the culture is non-pathogenic / non-hazardous in nature. (Select correct option)

Whether the culture is for common distribution (Yes / No):

(If it is not for common distribution, we may charge you for maintenance)

(I/we hereby authorize that culture deposited shall be without any encumbrances and shall become the property of NCIM Resource Center. NCL is free to distribute the culture for general, R & D, and for commercial exploitation on request without any liability to the depositor).

Signature with date

FOR NCIM OFFICE USE ONLY

Received for deposit on

Assigned in Database on

NCIM accession number-

For related query- ncim@ncl.res.in

Copyright@NCIM-NCL

Search engine-Type NCIM-NCL

NC_GenDep_07_2013 (Internal reference)

1.3 DISTRIBUTION OF CULTURES

NCIM endeavors to supply pure, nonpathogenic, viable and authentic cultures. Orders for cultures are accepted by letters on official letter-head duly signed by Head of the Institute/Department and should specify the scientific name of the microorganism and preferably its NCIM accession number. **Orders by telephone are not accepted.**

The cultures are generally supplied on agar slopes and are sent by registered parcel only after the receipt of the payment. The payments for the cultures should be made in advance either by cash or demand draft payable to **Director, National Chemical Laboratory, Pune 411 008 at Pune branch. The requestor should confirm the availability of cultures before making the payment. Please indicate correct address to which cultures should be sent. (We do not accept the cheques).**

The correspondence regarding the supply of cultures as well as for catalogue should be addressed to:

**Head,
NCM Resource Centre,
National Chemical Laboratory
Pune 411 008, Maharashtra
INDIA
Tel : 020-25902670 Fax : 020- 25902671
E-mail : ncim@ncl.res.in.
Please visit us at
<http://ncl-india.org/ncim/>
<http://wdcm.nig.ac.jp/CCINFO/CCINFO.xml?3>**

The cultures, if, found damaged by postal handling or contaminated during the transit will be replaced free of cost only if these are returned to us within three weeks. **The charges per tube/vial for the cultures are as follows**

- | | |
|--|---|
| ▪ Government Institutes/Universities/
CSIR Laboratories | Rs. 500/- (Plus 12.3% service tax) |
| ▪ Industries/Commercial Institutes | Rs. 1500/- (Plus 12.3% service tax) |
| ▪ Overseas countries | US\$80/-
(excluding service, postage & handling) |
| ▪ NCIM catalogue of strains | Rs. 200/- |

It should please be noted that there is no practice of sending invoice or bills in triplicate. Please contact our Accounts Section for receipt (Tel. 25902661, Email: sfao@ncl.res.in)

1.4 MICROBIAL IDENTIFICATION BASED ON DNA SEQUENCING

The collection accepts the cultures for identification based on DNA sequencing.

1.5 PATENT CULTURES

The collection accepts maintenance of cultures with a fee which are the subject of a patent application. Such cultures will be catalogued with NCIM accession number. These will be distributed subject to the approval of the patentee while the patent is pending.

1.6 OTHER SERVICES

- Lyophilization of microbial cultures.
- Long term preservation of specialized cultures from other institutes and industries on their request.
- Training facility for maintenance, preservation and other microbiological techniques.

Detail information and estimation of fees for undertaking the activity is available on request. The research and particular needs of industries will be discussed and handled in complete confidence.

2.0 NCIM CATALOGUE

This catalogue does not claim to be a standard work of up-to-date nomenclature. It is compiled for the convenience of the microbiologists who want to use our cultures. The species names used in the catalogue are, as far as possible brought up-to-date.

The NCIM numbers of the strains appear under the specific name. The synonyms of the strains are also described under the strains in italics.

2.1 ARRANGEMENT OF STRAIN DATA

- i. NCIM accession number
- ii. Source with their number.
- iii. The year of deposition in NCIM, in brackets.
- iv. Biochemical performance and details of culture.
- v. Literature references pertinent to the strains, in brackets.
- vi. Other strain numbers and the accession numbers of other culture collections followed by maintenance medium and growth temperature, in brackets.
- vii. Media formulations, strains with special applications and numerical index is also incorporated at the end of the catalogue.

2.2 GENERAL INFORMATION

The following are few useful references pertaining to taxonomy, assay, media, maintenance and production.

TAXONOMY

BACTERIA :

- i. "Bergey's Manual of Systematic Bacteriology". vol.1 (1984); vol. 2 (1986); vol. 3 and 4 (1989). Williams and Wilkins, Baltimore, USA.
- ii. "International Journal of Systematic Bacteriology" ASM Publication, Washington D.C. USA.

FUNGI :

- i. "Illustrated Genera of Imperfect Fungi" by H. L. Barnett, Burgess Publishing Company, Minneapolis, USA. Second Edition, 1965.
- ii. "The Genus Aspergillus" by K.B. Raper and D. I. Fennell, Williams and Wilkins Co., Baltimore, 1965.
- iii. "Genera of Fungi sporulating in pure culture" by J.A. Von Arx Vaduz (Germany) J.Cramer, 1974.

YEAST:

- i. "The Yeasts" (A Taxonomic study) by J. Lodder. North Holland Publishing Co., Amsterdam, 1970.
- ii. "The Yeasts" by A.H.Rose and J.H.Harrison. Vol.1 (1987) and vol. 4 (1991). Academic Press, London, UK.

ASSAY METHODS

- i. "Practical Methods for the Microbiological Assay of the vitamin B-complex and amino acids" by E.C.Barton - Wright, United Trade Press, London, 1961.
- ii. "Analytical Microbiology" by F. Kavanagh, Academic Press, 1963.
- iii. "Official, Standardised and recommended Methods of Analysis" by S.C.Jolly, Society for Analytical Chemistry, Cambridge, 1963.
- iv. U.S.Pharmacopoeia, 1980.
- v. British Pharmacopoeia, 1980; Addendum 1983.
- vi. "Assay Methods of Antibiotics" by D.C.Grove and W.A.Randall, Antibiotics Monographs No. 2, New York, Medical Encyclopidia, Inc., 1955.
- vii. "The Vitamins" by Paul Gyorgy, Vol.I, Academic Press, New York 1950.

MEDIA AND MAINTENANCE

- i. "Methods in Microbiology" (Vol I-VIII) by T.R.Morris and D.W.Robinson, Academic Press, New York, 1969-1973.
- ii. "Maintenance of Microorganisms and Culture Cells" A Manual of Laboratory Methods, by B.E. Kirsop and A. Doyle, Academic Press, New York, 1991.
- iii. "Handbook of Microbiological Media" by R.M.Atlas and ed. by L.C.Parks, C.R.C.Press, London. 1993.

PRODUCTION AND MISCELLANEOUS

- I. "Industrial Microbiology" by A.H.Rose, Butterworths, London ,1961.
- ii. "Manual of Industrial Microbiology and Biotechnology" by A.L.Demain and N.A.Solomon, American Society for Microbiology, Washington D.C. 1986.
- iii. "Enzyme Technology for Industrial Applications" by L.M.Savage,IBC Biomedical Library Series, Southborough, USA.1996.

2.3 ACKNOWLEDGEMENT

We wish to acknowledge gifts of cultures from several culture collections, viz. Prairie Regional Laboratory, Saskatoon, Canada; National Collection of Yeast Cultures, Nutfield, Surrey, London; National Collection of Industrial and Marine Bacteria Ltd. Aberdeen, Scotland and various other culture collections, Collections marked with an asterisk in the list of abbreviation which have donated the cultures. Special mention should be made of National Collection of Industrial and Marine Bacteria Ltd. Aberdeen, Scotland, for giving us nearly 350 cultures of bacteria as a free gift. Many of the references have been drawn from the NCIB Catalogue and permission from the Director of Torry Research Station to quote from their catalogue is gratefully acknowledged. We are also indebted to individuals who have generously supplied cultures to this collection.

2.4 LIST OF ABBREVIATIONS

AMNH	American Museum of Natural History, New York, USA.
ATCC	American Type Culture Collection, 12301, Parklawn Drive, Rockville, Maryland 20852, USA.
BAIF	Baif Laboratories Ltd., Wagholi, Pune, India.
BARC	Bhabha Atomic Research Centre, Trombay, Mumbai, India.
BCC	Biotec Culture Collection, Thailand
BKMB	
BS	Department of Microbiology, Faculty of Natural Sciences, Brno, Czechoslovakia.
BUCSAV	Biologicky Ustav, Ceskoslovenska Akademie Ved, Prague, Czechoslovakia.
CBS	Centraalbureau voor Schimmelcultures, Baarn, Netherlands.
CCAP	Culture Centre for Algae and Protozoa. Ambleside, U.K.
CCEB	Culture Collection of Entomogenous Bacteria, Department of Insect Pathology, Institute of Entomology, CSAV, Nacvicisti 2, Prague 6, Czechoslovakia.
CCM	Czechoslovak Collection of Micro organisms, J.E. Purkyne University, Brno, Czechoslovakia.
CCY	Czechoslovak Collection of yeasts, Bratislava, Dubravska, Cesta CSSR.
CDA	Canadian Department of Agriculture, Ottawa, Ontario, Canada.
CDC	Centre for Disease Control, Atlanta, Georgia.
CDRI	Central Drug Research Institute, Lucknow 226 001.
*CFTRI	Central Food Technological Research Institute, Mysore 570 013.
CLRI	Central Leather Research Institute, Madras.
CMI	Commonwealth Mycological Institute, Kew, Surrey, U.K.
CPHERI	See NEERI.
CRI	Central Research Institute, Kasauli.
DB	Division of Bacteriology and Dairy Research, Department of Agriculture, Ottawa, Canada.
*DRL	Defence Research Laboratory, P.B. 320, Kanpur 208 002.
DSM	Deutsche Sammlung von Mikroorganismen Und Zellkulturen, Gmbh
ETH	Eidgenossische Technische Hochschule, Zurich, Switzerland.
FDA	Food and Drug Administration, Washington, D.C., USA.
FRI	Forest Research Institute, Dehra Dun.
HAL	Hindustan Antibiotics Ltd., Pimpri, Pune 411 018.
HMS	Hopkins Marine Station, Pacific Grove, California, USA.
HUT	Hiroshima University, Faculty of Engineering, Hiroshima, Japan.
IAM	Institute of Applied Microbiology, Univ. of Tokyo, Japan.
IARI	Indian Agricultural Research, Pusa Road, New Delhi.
ICI	Imperial Chemical Industries, Ltd., Butterwick Researc Laboratories, Welwyn, England.
ICPB	International Collection of Phytopathogenic Bacteria University of California, Davis, California.
ICRC	Indian Cancer Research Centre, Parel, Mumbai 400 009
*IDRI	Indian Dairy Research Institute, Bangalore 56000 (see NDRI).
*IFO	Institute for Fermentation, Osaka, Japan.

*IISc	Indian Institute of Science, Bangalore 560 012.
*IMI	See CMI.
ISP	International Streptomyces Project.
JCM	Japan Collection of Microorganisms
KCC	Kaken Chemical Company, Ltd., Tokyo, Japan.
KCTC	Korean Collection for Type Cultures, Republic of Korea
LBG	Institute fur Landwirtschaftliche Bakteriologie und Garungs biologie, Eidgenossische Technische Hochschule, Zurich, Switzerland.
LMG	Laboratorium voor Microbiologie, Universiet Gent (Belgian Coordinated Collections of Microorganisms)
MACS	Maharashtra Association for Cultivation of Science,(Agharkar Research Institute) Pune 411 004.
MDB	See CCM.
MTCC	Microbial Type Culture Collection, Institute of Microbial Technology, Chandigarh, India.
NCA	National Canners Association, Washington, D.C., USA.
NCDO	National Collection of Dairy Organisms, Shinfield, Berkshire, England.
*NCIB	National Collection of Industrial Bacteria, Torry Research Station, Aberdeen, Scotland.
NCIM	National Collection of Industrial Microorganisms, National Chemical Laboratory, Pune 411 008.
NCIMB	National Collection of Marine and Industrial Bacteria (See NCIB)
NCL	National Chemical Laboratory, Pune 411 008.
*NCTC	National Collection of Type Cultures, Central Public Health Laboratory,Colindale Avenue, London, N.W.9.,U.K.
*NCYC	National Collection of Yeast Cultures, Nutfield, Surrey, England.
*NDRI	National Dairy Research Institute, Karnal 132 001. (see IDRI)
NEERI	National Environmental Engineering Research Institute, Nagpur.
NIRD	National Institute for Research and Dairying,Shinfield, Berks, England.
*NRC	National Research Council, Ottawa, Ontario, Canada.
*NRRL	Northern Utilization Research & Development Division, U.S. Department of Agriculture, Peoria,Illinois, USA.
PCI	Penicillin Control & Immunology Section, Food & Drug Administration, Washington, D.C., USA.
*PRL	Prairie Regional Laboratory, Saskatoon, Canada.
PSA	Progetto Sistematica Actinomyceti, Institutio "P. Stazzi", Milan, Italy.
PTCC	Persian Type Culture Collection, Tehran.
QEC	Queen Elizabeth College, London University, London.
*QM	Quartermaster Research and Engineering Centre, U.S.Army Natick, Massachusetts.
UNBA	United Nations Bureau of Agriculture.
USDA	United States Department of Agriculture, Washington,D.C., USA.
*WB	University of Wisconsin, Madison, Wisconsin.
WHO	World Health Organization.