WORLD FEDERATION FOR CULTURE COLLECTIONS Newsletter (No.50)–JULY 2011

IMCAS Launches World Data Centre for Microorganisms

Institute of Microbiology, Chinese Academy of Sciences (IMCAS) launched the WFCC (World Federation for Culture Collection) -MIRCEN (Microbial Resources Centres) World Data Centre for Microorganisms (WDCM). The inauguration Ceremony of WFCC-MIRCEN WDCM and the First WDCM Seminar were held on May 17, 2011 in Beijing. The ceremony and seminar were organized by Institute of Microbiology, Chinese Academy of Sciences (IMCAS), World Federation for Culture Collections (WFCC), The Committee on Data for Science and Technology (CODATA) and Research Network for Applied Microbiology, Chinese Academy of Sciences (RNAM).

Prof. Philippe DESMETH, president of WFCC, Prof. Li HUANG, director of IMCAS, representative of Prof. Huadong GUO, president of CODATA, Prof. Hideaki SUGAWARA, former president of WDCM, Mr. R. Jayakumar, officer from UNESCO and Prof. Juncai MA, Director of WDCM, and also WFCC Executive Board members Dr. Takashi Itoh, Prof. Kevin McCluskey, Prof. Xiuzhu Dong joined the ceremony and seminar. Head of Office of Informatization Leading Group, Chinese Academy of Sciences (OILG-CAS) and officers of Bureau of Life Science and Biotechnology, Chinese Academy of Sciences (BLSB-CAS), which is support organization of the meeting, also joined the ceremony.

Prof. SUGAWARA, former president of WDCM, officially transferred the host of WDCM to IMCAS and Prof. Juncai MA becomes the new president of WDCM. IMCAS won the bid for hosting WDCM in October 2010 and will undertake its development in the coming years. It is the first world data centre in the field of life sciences settled in China and will promote China's microbial research extensively in international arena and establish a data-sharing platform of global microbial resources.

During the ceremony, Prof. Philippe DESMETH, Prof. Li HUANG, representative of Prof. Huadong GUO, Prof. Hideaki SUGAWARA and Prof. Juncai MA gave keynote

Edited by Dr Ipek Kurtböke, University of the Sunshine Coast, Australia

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speeches about the roles of WFCC, the Introduction to CODATA and Date-intensive Science, current state of microbial resource research in China and RNAM (Research Network for Applied Microbiology, CAS), transmission to the third generation of World Data Centre for Microorganisms (WDCM) and the future tasks of WDCM.

As new president of WDCM, Prof. MA stated that his research group plans to do more research on analysing the function of microbial resources and make the information available to international communities. Although multiple functions of microorganisms have been explored to produce food and medicine, protect environment and transform energy, the functions of a large number of microbes still remain unknown. If their efforts count, research institutes and companies may find it much easier to search for the right microbial resources with the help of WDCM.

Philippe DESMETH, President of WFCC in the Ceremony

HUANG Li, Director-general of IMCAS

R. Jayakumar, Programme Specialist of Science, Technology and Environment of UNESCO Office, Beijing

Hideaki Sugawara, former President of WDCM

Juncai Ma, new President of the WDCM

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Professors Sugawara and Suzuki and WFCC President Philippe Desmeth interviewed by journalists from Science Times

On May the 18th after the WDCM ceremony and seminar, WFCC members and other specialists had a lively discussion focused on the following three topics: Model Culture Collections and Networking, Socio-economic/Education and Public-relations Platform and data management software package for sharing microbial resources information. Finally, reached conclusions for the discussion were:

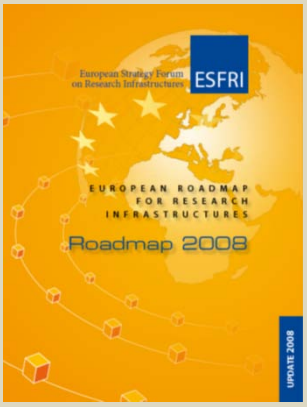
1: WDCM will provide personalized service for WFCC members and WFCC registry collections. The service will include interface for information customization, and online collaborative working platform for WFCC members and so on.

2: Socio-economic/education and public relations are crucial topics for WFCC future development. As introduced by Prof. Philippe DESMETH and Prof. Hideaki SUGAWARA, DSMZ and National Institute of Genetics (NIG) could provide experience for these works. On the other hand, the representative from Computer Network Information Centre (CNIC) CAS states that CAS could provide strong support for the popularization of WFCC and microbes.

3: It's very important for WFCC to construct a global microbial resources database management system based on the current WDCM CCINFO and Strain DB. The WFCC will organize its members to work on standards and functions of the databases management system. The WDCM will be responsible for the design and implementation of the software.

NEWS FROM MEMBERS

Update on MIRRI



A Microbial Resources Research Infrastructure (MIRRI) preparatory phase project development meeting was held back to back with ECCO XXX in Utrecht. The high turnout at the meeting (over 50) reflected the interest ECCO members and others had in participating in MIRRI. A draft outline MIRRI proposal had been circulated to ECCO members, feedback had been received particularly from other ESFRI RIs (OPENSCREEN and EATRIS – http://ec.europa.eu/research/infrastructures/index_en.cfm?pg=esfri-roadmap) and a revised set of objectives was presented and discussed. Further information on MIRRI is available at www.mirri.org.

- The European Strategy Forum for Research Infrastructures (ESFRI) was established in 2002 to support a coherent and strategy-led approach to policy-making on research infrastructures in Europe with goals to:
- Facilitate multilateral initiatives leading to the better use and development of research infrastructures, at the EU and international level
- Develop pan-European structures to drive innovation to provide the resources, technologies and services as the basic tools necessary to underpin research
- Overcome the limits due to fragmentation of individual policies

MIRRI will provide facilitated access to microbiological services and high quality microorganisms, their derivatives and associated data for research, development and application. MIRRI will connect resource holders with researchers and policy makers to deliver the resources and services more effectively and efficiently to meet the needs of innovation in biotechnology. The aim is to improve the microbial resources and services needed for research and consequently accelerate the discovery process. ESFRI launched ten research infrastructures in the biological and medical science area and added 3 new ones to road map last year, including MIRRI.

In Utrecht it was agreed that the drafting group would develop the next draft and circulate it to ECCO members in July. In parallel European collections were invited to express their interest in working towards the objectives and how they might participate in the MIRRI preparatory phase. A meeting of work package leaders will be arranged in September to finalise the proposal for submission by the deadline of 23 November 2011.

Visit: www.mirri.org

Romanian Bioresource Centre

Dr. Sergiu Fendrihan

Biotechnology and biotechnologically based agriculture and industry have an important role to play within *The National Development and Research Program in* Romania. A green future is envisaged by different international and European research programs focused on bioindustries including fuels, energy, environmental cleaning and biosafety. At the same time, the market for bio and biotechnological products is growing, as well as the interest for a clean environment and keeping and conserving the biodiversity. Romania is part of the Budapest Treaty of 1977, and signatory to the Biodiversity Convention of Rio de Janeiro, 1992. Many collections are maintained by institutes like Cantacuzino Institute and Pasteur Institute in Bucharest that are producers of vaccines and serums and other biological medical products. Others are collections of researchers from different institutions but many of them require compliance with the international standard. In July 2008, three Romanian scientists, Dr. Sergiu Fendrihan, Dr. Maria Oprea and Dr. Georgeta Negru established the Romanian Bioresource centre as an NGO using their own financial and material resources. In November 2000, we received an important donation from some physicians from Salzburg and from other private persons, which we matched with our resources (we buy different laboratory items from internet), the equipment was transported thanks to the sponsorship of Lagermax and assistance from Intercargo Austria to Bucharest. The items, a majority of which was second hand, can be used in the laboratory for the first stage in order to maintain our cultures. A part of the cultures are donation of Maria Oprea and Sergiu Fendrihan and others containing about 400 fungi and about 20 Archaeal and bacterial strains. The National Institute of Research for Biological Sciences offer us two rooms to keep our collections. At present, our association has 27 volunteers and 8 members. Some of them contribute work and financial resources to maintain the collections. One of our achievements is the affiliation to the WDCM and accreditation by our National Agency for Science Research and Technology, and the Parliamentary Commissions of Health Agriculture and Environment.

Within three years of founding, we established a little laboratory, participated in over 20 scientific meetings and worked to issue standards, adopted standards and protocols from CABRI, we developed a small culture collection, published a newsletter and became a member of different national and international associations. Our members are scientists, doctors or doctoral students or operate in biochemical and biomedical sciences. Two collections now will become our members and more will come in the future. We are recognized by our research agency, and we are able to perform research alone and also within international or national consortiums. This year we are applying for public utility status and we have just obtained the trade mark from our Patent Office.

We organised in 2009 the First National Conference of Culture Collection of Microorganisms and Cells Lines from Romania with an interesting debate on maintenance of culture collections and their future in Romania. We are participating in a consortium of international centres of excellence for research on the Danube, Danube Delta and Black Sea with facilities developed at Murighio; in Danube Delta on a 10 hectares land offered by the Romanian Government from 2011.

In November 2010, we took part in the meeting of GBRCN Human and Microbes in Vienna. We have the intention to establish a bio bank in cooperation with the University of Medicine and Pharmacy in Bucharest and hope to access some funding for this. From our collections, we can mention *Alternaria cucumerina, Alternaria ribi*, *Aspergillus ustus, and Penicillium gladioli*. From the halophilic Achaea collection we have some new strains isolated from Romanian rock salt that are

still under studies of identification and characterisation. One was identified to belong 99% *Halorubrum* genus.

Another recent achievement has been the participation of 3 of our members in EMbaRC project to be trained for the preservation and maintenance of microorganisms and molecular identification of microorganisms at CABI Biosciences in Egham, England in May 2011.

The purpose of our organization is to establish the Bioresource Centre of Romania as well as a network of collections of biological material according to the international standards and OECD good practice recommendations. The members will become the employee of the centre in order to maintain the collections. We are now trying to create partnership with or even to become a part of our Romanian Academy or part of a National Institute or a University, and the discussions are in progress and will hopefully finish this year so that financial and institutional support can be secured.

Current WFCC-CC catalogues as a starting ground for networking efforts

A. Vasilenko, S. Ozerskaya, O. Stupar
All-Russian collection of microorganisms,
IBPM RAS, Russia

Introduction

The activities and profiles of culture collections (CC) are usually mirrored in their catalogues. Some of them are currently available electronically. Both WFCC and GBRCN expressed interest in developing informational network(s) [1, 2] integrating and consolidating CC activities in the field of bioinformation. Previous efforts along these lines had been made within such projects as MINE [5], CABRI (www.cabri.org). OECD provided certain guidelines [2, 3, 4] concerned with bioinformatic activities for BRC, which are also useful for all CCs interested in networking.

Electronic networking presupposes that the prime recipient of a message is a machine, rather than a human being. It follows that certain barriers for communication might arise which might be hardly noticed by a human being but emerge as quite serious for a machine (i.e. language, format of a message, etc).

The aim of this analysis is to pinpoint and enumerate some of the most obvious barriers of this sort. According to pos. 6 of protocol IT strategy meeting, 29.09.2010, Florianopolis, Brazil “All data available on the network will be freely and openly accessible to all”. We understand that this “free and open access” on GBRCN or WDCM web site means operation of some request system that provides any fragments of the accumulated database to any user - in the web page format or in the file uploaded. A user request in such a system cuts out the database fragment where some selected characteristics of microorganisms (MO) relate to some values (e.g. request “select MO=Bacteria with *Cultivation Temperature* <10^{o}C”). The study tries to evaluate if the culture collections catalogues are really ready for this kind of global use, mainly for an understanding of the level of relevance of the answers to the real characteristics of microorganisms in the network. The characteristics in these requests are set by the fields of the accumulated database and the relevance level considered here depends on:

- The scope of each field inside the total database. the part of the database records that have the data of this field,
- The consistencies between the data - can the values be considered as the same, or complementary, or are they in conflict.
- To see this we compared the CC catalogues available against OECD requirements. The study was carried out inside GBRCN IT clustering, but, in fact, all the WFCC culture collections were considered as possible potential participants of the GBRCN system and analyzed here.

Total number and % of online catalogues considered

Most electronic catalogues were analyzed here through relevant request systems: the database itself is largely unavailable.

To collect the data, we checked all the CC addresses on WDCM web site and in the next step looked for CC names and acronyms on www.google.com. Only 95 collections with On-line request systems were found in this search. In reality one would expect to find more of them here, but they were not found by the method employed.

To ensure comparability of GBRCN, EMbaRC (www.embarc.eu) and Straininfo (www.straininfo.net) projects partners in this respect we also included four collections that are in GBRCN project but not on WDCM list: their acronyms are BGB, SinBiota, HUEFS and CFAF (http://www.splink.org.br/index). So, with the nine collections with «English text Catalogues», 108 culture collections were analyzed - from the complete list of 586 WFCC members on December 2010.

Fig. 1: Web sites, sorted by the countries and WDCM numbers (last visited 18.09.2010)

WCDM NMBR	ACRONYM	COUNTRY	URL
803	RDCM	Armenia	http://wdcm.nig.ac.jp/catalogue/rcdm/rcdm.html
13	ACM	Australia	www.babs.unsw.edu.au/files/babs_cultures_catalogue.pdf
532	CCLM/CSIRO	Australia	http://www.csiro.au/places/Australian-National-Algae-Culture-Collection--ci_pageNo-1.html
839	ACBR	Australia	http://www.acbr-database.at/BioloMICS.aspx
909	BIM	Belarus	http://www.mbio.bas-net.by/
296	BCCM/LMG	Belgium	http://bccm.belspo.be/about/lmg.php
308	BCCM/MUCL	Belgium	http://bccm.belspo.be/about/mucl.php
642	BCCM/IHEM	Belgium	http://bccm.belspo.be/about/ihem.php
643	BCCM/LMBP	Belgium	http://bccm.belspo.be/about/lmbp.php
110	IBSFB	Brazil	http://www.splink.org.br/index
364	BR	Brazil	http://splink.cria.org.br/manager/detail?resource=BR&setlang=pt
575	INCQS	Brazil	http://www.splink.org.br/index
604	URM	Brazil	http://www.splink.org.br/index
712	CG	Brazil	http://www.splink.org.br/index
731	CLIOC	Brazil	http://www.splink.org.br/index
823	CBMAI	Brazil	http://webdrm.cpqba.unicamp.br/cbmai/
867	CCGB	Brazil	http://splink.cria.org.br/manager/detail?resource=CCGB&setlang=pt
947	IOC	Brazil	http://www.splink.org.br/index
	BGB, SinBiota, HUERS, CFAF	Brazil	http://www.splink.org.br/index
135	NBIMCC	Bulgaria	http://www.nbimcc.org/cabricat/Main.php
6	HER	Canada	http://www.phage.ulaval.ca/index.php?pageDemandee=search
73	UAMH	Canada	http://www.devonian2.ualberta.ca/uamh/on-line_catalog.htm
388	SGSC	Canada	http://people.ucalgary.ca/~kesander/catalogue.html
605	CPCC	Canada	http://www.phycol.ca/search/node/
582	CICC	China	http://www.china-cicc.org/English/english.html
65	CCM	Czech	http://sci.muni.cz/ccm/index.html
130	CNCTC	Czech	http://www.szu.cz/cnctc/a/uvod.php
486	CAUP	Czech	http://botany.natur.cuni.cz/algo/caup-list.html
558	CCBAS	Czech	http://www.biomed.cas.cz/ccbas/fungi.htm
905	CCALA	Czech	http://www.butbn.cas.cz/ccala/index.php?page=se&st=as
935	SCCAP	Denmark	http://www.sccap.dk/search/
926	CELMS	Estonia	http://www.miccol.ut.ee/385219
139	VTT	Finland	http://culturecollection.vtt.fi/
779	HAMBI	Finland	http://www.mm.helsinki.fi/mmkem/hambi/
639	CFBP	France	http://www-intranet.angers.inra.fr/cfbp/recherche_e.php
759	CRBIP/CIP	France	http://www.crbip.pasteur.fr/onglet.jsp?tab=bact
788	CIRM-Levures	France	http://genome.jouy.inra.fr/cirm/bdd/
796	ALGOBANK	France	http://www.unicaen.fr/ufr/ibfa/algobank/EN/catalogue/catalogue1.php
829	RCC	France	http://www.sb-

			roscoff.fr/Phyto/RCC/index.php?option=com_dbquery&Itemid=34
879	LeishCryoBank	France	http://www.parasitologie.univ-montp1.fr/catalogue_list.asp
917	CIRM-BP	France	http://www.tours.inra.fr/cirm_bp_eng/commander_une_souche/le_catalogue
918	CIRM-BIA	France	http://jwsdp.jouy.inra.fr/Consult/exeRequete.jsp?cirm=gisilbia
192	SAG	Germany	http://sagdb.uni-goettingen.de/
274	DSMZ	Germany	http://www.dsmz.de/microorganisms/main.php?menu_id=2
807	CCAC	Germany	http://www.ccac.uni-koeln.de/recherche.shtml
919	FSU	Germany	http://www.frc.uni-jena.de/stammsammlung.php
940	CCCryo	Germany	http://cccryo.fraunhofer.de/web/strains/
485	NCAIM	Hungary	http://web.uni-corvinus.hu:8089/NCAIM/frameset.jsp
3	NCIM	India	http://www.ncl-india.org/ncim/catelogue.jsp?mid=29
773	MTCC	India	http://mtcc.imtech.res.in/catalogue.php
945	CRA-PAV	Italy	http://www.collezionedimicrorganismi.com/index.cfm?cis=1#strt
195	HUT	Japan	http://home.hiroshima-u.ac.jp/hut/
567	JCM	Japan	http://www.jcm.riken.jp/JCM/catalogue.shtml
591	NIES	Japan	http://mcc.nies.go.jp/
637	MAFF	Japan	http://www.gene.affrc.go.jp/databases-micro_search_en.php
825	NBRC/IFO	Japan	http://www.nbrc.nite.go.jp/e/index.html
597	KCTC	Korea	http://www.brc.re.kr/English/ekctc.aspx
806	KACC	Korea	http://www.genebank.go.kr/
903	CFGR	Korea	http://genebank.riceblast.snu.ac.kr/
500	CDBB	Mexico	http://micro500.cs.cinvestav.mx/
817	LIH-UAM	Mexico	http://www.histoplas-mex.unam.mx/index_i.html
883	CCMM	Morocco	http://www.ccmm.ma/catalogue.htm
133	CBS	Netherlands	http://www.cbs.knaw.nl/databases/
797	NCCB	Netherlands	http://www.cbs.knaw.nl/databases/
589	ICMP	New Zealand	http://nzfungi.landcareresearch.co.nz/icmp/search_cultures.asp
212	IAFB	Poland	http://kkp.ibprs.pl/
914	CCBA	Poland	http://pasat.ocean.univ.gda.pl/~ccba/ipl.php?id=ba-cya
816	MUM	Portugal	http://www.micoteca.deb.uminho.pt/
906	ACOI	Portugal	http://acoi.ci.uc.pt/
342	VKM	Russia	http://www.vkm.ru
596	IPPAS	Russia	http://www.ippras.ru/cfc/
768	IEGM	Russia	http://www.iegm.ru/iegmcol/strains/index.html
836	CCIBSO	Russia	http://www.rbcar.ro/catalogues.htm
412	CECT	Spain	http://www.cect.org/english/
32	CCUG	Sweden	http://www.ccug.se/
603	UPSC	Sweden	http://www-hotel.uu.se/evolmuseum/fytotek/
651	FCUG	Sweden	http://www2.dpes.

			gu.se/FCUGsrch.html
475	VTT/CCTM	Switzerland	http://culturecollection.vtt.fi/ccdb/html?p=s
59	BCRC/CCRC	Taiwan	http://www.ccrc.firdi.org.tw/
383	TISTR	Thailand	http://www.biotec.or.th/tncc/tistr_dete.html
705	BBPP/DOA	Thailand	http://www.biotec.or.th/tncc/dbstore/DOAC_search.asp
707	DMST	Thailand	http://www.biotec.or.th/tncc/
783	BCC	Thailand	http://www.biotec.or.th/bcc/InternetSearch.asp
828	RSKK	Turkey	http://www.rshm.gov.tr/en/index.php?option=com_content&task=view&id=34&Itemid=61
126	NCPPB	UK	http://www.ncppb.com/ncppbsearch.cfm
128	FLY	UK	http://www.mba.ac.uk/culturecollection.php
134	NCWRF	UK	http://www.bio-aware.com/cabi/Defaultinfo.aspx?Page=Home
137	ECACC	UK	http://www.hpacultures.org.uk/collections/ecacc.jsp
154	NCTC	UK	http://www.hpacultures.org.uk/collections/nctc.jsp
169	NCYC	UK	http://www.ncyc.co.uk/
184	NCPF	UK	http://www.hpacultures.org.uk/collections/ncpf.jsp
214	IMI	UK	http://www.bio-aware.com/cabi/Defaultinfo.aspx?Page=Home
522	CCAP	UK	http://www.ccap.ac.uk/ccap_search.php
653	NCIMB	UK	http://www.ncimb.com/search.php?par
			ent=culture
814	NCPF	UK	http://www.hpacultures.org.uk/collections/ncpv.jsp
1	ATCC	USA	http://www.lgcstandards-atcc.org/ATCCCulturesandProducts/tabid/979/Default.aspx
2	CCMP	USA	https://ccmp.bigelow.org/search_strains
97	NRRL	USA	http://nrrl.ncaur.usda.gov/cgi-bin/usda/
112	ARSEF	USA	http://arsef.fpsnl.cornell.edu/mycology/ARSEF_Culture_Collection.html#Catalogs
115	FGSC	USA	http://www.fgsc.net/scripts/catalog.asp
530	LMS	USA	http://www.carolina.com/
573	BGSC	USA	http://www.bgsc.org/
606	UTEX	USA	http://web.biosci.utexas.edu/utex/Search.aspx
827	CGSC	USA	http://cgsc.biology.yale.edu/
849	DSC	USA	http://www.dictybase.org/StockCenter/StockCenter.html
888	UCD-FST	USA	http://www.phaffcollection.org/
933	VTCC	Viet Nam	http://biotechvnu.edu.vn/vtcc/

The general information on WFCC culture collections are given in Figures 2 and 3.

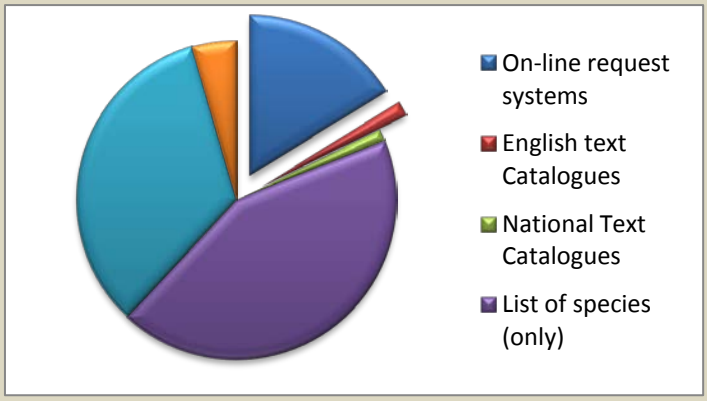
- The number of collections that have web sites and catalogues on-line:
  - line «On-line request systems» means total number of culture collections that have web sites, catalogues and request systems in English or other European language (Roman alphabet),
  - line «English text Catalogues» – means number of CC with text catalogues available on-line in Internet (Roman alphabet),
  - line «National text Catalogues» – means CC with web sites in some other type of coding (Chinese, Korean, etc.).

- «List of species (only)» means the number of collections that show the lists of MO names only –on WDCM web site (wdcm.nig.ac.jp/hpcc.html).
- «Type of cultures (only)» means the number of collections that show MO types only on WDCM web site.
- Number of collections with no information on microorganisms which they keep.

Fig. 2: Main groups of CC with respect to data offered

On-line request systems	95
English text Catalogues	9
National Text Catalogues	7
List of species (only)	252
Type of cultures (only)	197
No Information	26
Total	586

Fig. 3: Main groups of CC on a circle diagram



OECD requirements for the content of catalogues

The main source of OECD requirements, including the standards specifications, is OECD Best Practice Guidelines for Biological Resource Centers [2]. In this document, there are references to the Guidance for the operation of Biological Resource Centers (BRCs) Part 1 [3] and 2 [4], to CABRI web site (www.cabri.org), to Darwin Core standard (rs.tdwg.org/dwc/terms/index.htm) and ABCD (www.tdwg.org/activities/abcd/). The Guidelines, Guidance and CABRI web site present slightly different specifications for the Minimum Data Set (MDS), Recommended Data Set (RDS) and Full Data Set (FDS) standards. In each case of inequality we followed the rules:

- Best Practice Guidelines requirements are of a higher priority,
- If a field is in MDS list for some microorganisms and in RDS list for other we selected MDS for both, and in the same kind of RDS-FDS choice we selected RDS.

Analysis of catalogues against OECD requirements

- Formally speaking position 1 in Fig. 4 is addressed in any case: the culture collections really consider the standards.
- Position 2, **the reference lists and thesauri** is the standard information practice in CC. Nevertheless typing errors occur.
- Position 3 – **consistency** among CC – is really a problem. Most of collections show not all the MDS fields in catalogues, and they use additional fields as well. Especially with regard to RDS and FDS and compliance to these requirements in fact do not insure the full compatibility among CC catalogues. The examination shows four factors that cuts the scope of the fields in possible request system and make the values inconsistent:
- (1) Collections differ in selection of the fields,
- (2) Some differences in understanding of the same fields are apparent,
- (3) Different content while the understanding presumably is the same,
- (4) Different typing for the same content is used.
- Factors (1) and (2) are specified by the standard, factors (3) and (4) aren't regulated, they are more difficult to classify, but we can give some examples.

The first sources of different typing (factor (4)) are typos. Fig. 5 shows a typos example from the real debugging procedure in VKM catalogue. Acronym VKM in Russian is BKM. This word looks the same in Roman alphabet (format EEE) and in Cyrillic (format RRR). Acronym BKM is used in Russian language, so Cyrillic format RRR applies; while in the Roman format (EEE) does not. But, in fact, any letter in this word potentially can be done in Roman alphabet (E) or in Cyrillic (R). This makes 6 additional erroneous formats: EER, ERE, ERR, REE, RER, RRE. In fact, we had to process all of them.

Additional typing formats reflect the national standards differences for Bibliography (the MDS field *Literature*), some national options in the field *Restrictions*, and the national alphabets.

Fig. 4: Key requirements of OECD Best Practice Guidelines

The BRC should use a standard terminology and formats for data management and exchange and standard protocols for data transmission to networks (domain, regional or global networks):

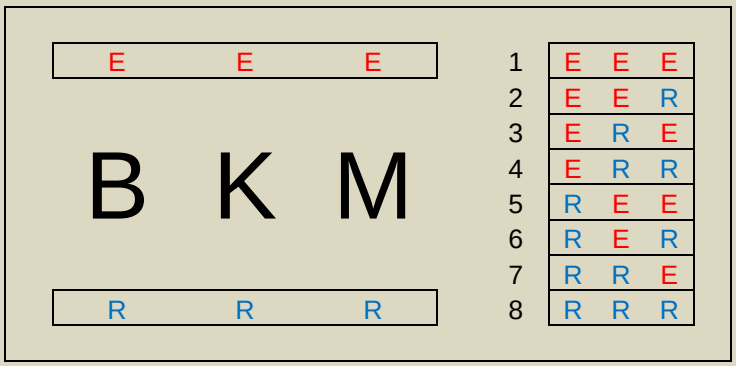
1. Select data format, data representation and data transportation taking into consideration existing standards for data processing, *e.g.* DarwinCore/DiGIR and ABCD schema/BioCASE for strain data, CCINFO for the organizational information of BRCs.

2. Check vocabulary against standard reference lists or thesauri.

3. Keep consistency among BRCs for searching and retrieving of information from catalogues and databases:

- Each biological material record should contain a Minimum Data Set, a Recommended Data Set and/or a Full Data Set in accordance with domain specific criteria
- Spell checking for every field should be a basic requirement.
- International English should be chosen as a preferred language of data (in addition to local language if different).
- A standardized approach should be adopted to certain scientific symbols (to avoid any errors due to incorrect reading of a character set, standard ASCII alternatives to symbols should be used.

Fig. 5: Possible typos in a word



To demonstrate the diversity of content (factor (3)) we examined presentations of one strain (*Aspergillus brasiliensis* Varga et al. 2007 was selected, VKM F-1119) in four collections: ATCC, CBS, DSM and VKM. We selected ATCC 9642, CBS 246.65, DSM 63263 and VKM F-1119 according to Strainfo histri tree, Fig. 6.

On Fig. 6 we can see that the information collected in the central node may not be corrected for a considerable time. Till 2007 this strain used to bear the name *Aspergillus niger*, after 2007 all the four collections changed the name for *Aspergillus brasiliensis*, but in Straininfo Hisrtri this new name is provided by VKM only.

So far, regarding the species name; on the Fig. 7 the content presented by four CC has been compared, CC acronyms make table rows, field names make columns. Examples of the differences in typing (factor (4)) are in the fields *Organism type*, *Name* (*Infrasubspecific names*), *Restrictions*, *and Deposited as* and in the common articles (field *Literature*). All the other fields, except "*Deposited as"* and "*isolated from"* in DSM and VKM, display the different content (factor (3)). In this comparison, 24 fields present one strain in four collections, and only two fields in two collections were the same. Potentially, it could be 144 coincidences, and formally for the computer this means that consistency level in this example is 1-2%. These four presentations are not so different and look complimentary for a human being, but in order to make them compatible and complimentary for a computer some additional algorithms should be used in processing the content in the database fields.

Fig 6: Strain information for *Aspergillus brasiliensis* Varga *et al*.

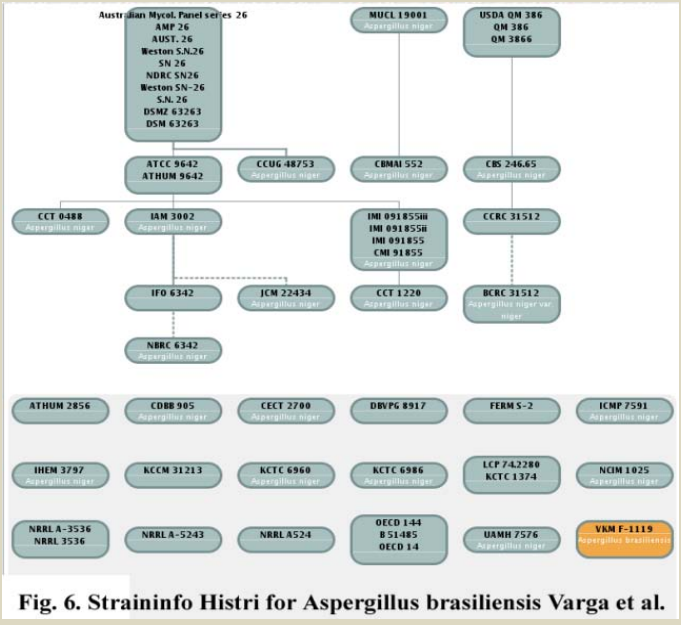


Fig. 6. Straininfo Histri for Aspergillus brasiliensis Varga et al.

This analytical and programming job was done within MINE framework [5], and later on in [6], [7], [8] and [9]. The practical success has been achieved by Straininfo team: algorithm for determining the equivalent cultures (system of «strains» and «histris») based on analysis of the MDS fields *Name, Status* and *History of Deposit* [7] in CC catalogues, section publications in the passport of strain based on analysis of RDS field Literature. Preparation of appropriate algorithms for the fields of *Geographic origin* and *Isolated from* (RDS) is presented

in [10]. The information on successful processing of most of other fields from MDS+RDS+FDS standard is also presented in [11].

Fig 7: Presentation of *Aspergillus brasiliensis* Varga *et al*. 2007 on ATCC, CBS, DSM and VKM web sites

	History of deposit	*Deposited as*	*Strain Designation*	*Depositors*
ATCC		*Aspergillus niger* van Tieghem, anamorph	SN 26	WH Weston
CBS				QM, Jul 1965
DSMZ	<- IMG, 4518 <- W. Kerner. [QM 386]	*Aspergillus niger*		
VKM	<-- INMI, VKM F-1119 <- ATCC, ATCC 9642	*Aspergillus niger*		

	Isolated from	*Isolated by*	*Geographic origin*	*Additional geographic data*
ATCC	wireless radio equipment		New South Wales, Australia	
CBS	radio equipment	R.E. Klausmeier, Indiana, Crane	Australia, New South Wales; Sydney	Latitude, longitude coordinates where collected: 33.8833333; 151.2166667
DSMZ	Radio set			
VKM	radio set		Australia, Sydney	

	Growth - Temperature	*Conditions for growth - Medium*	*Storage methods*
ATCC	24.0°C	ATCC medium: 336 Potato dextrose agar (PDA): Diced potatoes 300.0 g; Glucose 20.0 g; Agar 5.0 g; Distilled water 1.0 L	
CBS			
DSMZ	30°C	129. POTATO DEXTROSE AGAR Infusion from potatoes (see below) 1000.0 ml Glucose 20.0 g; Agar 15.0 g; Potato infusion: Boil 200 g scrubbed and sliced potatoes in 1000 ml water for 1 hour. Pass through fine sieve. Avoid new potatoes.	
VKM	25˚C	Medium 12 (Medium CZAPEK MEDIUM (CZ): NaNO3 3.0 g; K2HPO4 1.0 g; KCl 0.5 g; MgSO4 x 7H2O 0.5 g; FeSO4 x 7H2O 0.01 g; Sucrose 30.0 g; Agar 20.0 g; Distilled water 1000.0 ml; pH 6.0; Sterilize at 121 C for 30 min)	F-1, S-5, D-4

	Applications
ATCC	bacterial resistance testing adhesives [21459]; degrades plastics [52928] fungus resistance testing [21552] [92556] [92557] [92558]; fungus resistance testing adhesives [21456]; fungus resistance testing airborne equipment [21535]; fungus resistance testing automotive components; fungus resistance testing cork; fungus resistance testing electrical insulation [21543]; fungus resistance testing leather ; fungus resistance testing polymers [21471]; fungus resistance testing varnish; fungus resistance testing wax [21551]; produces isopullulanase pullulan 4-glucanohydrolase [700]; produces lactoylglutathione glyoxalase I [1390]; testing antimicrobial agent [92595]; testing wood preservatives [55647]
CBS	Enzymes: amylase; isopullulanase; lipase Decomposition: plastics Testing: assay of wood preservative chemicals; testing fungus resistance of plastics
DSMZ	Assay of wood preservative chemicals (3693), assay of fungus resistance test (3732)
VKM	

	Comments	*Genotype*
ATCC	This strain was recently re-named as *Aspergillus brasiliensis* according to the reference Varga et al. 2007. [92930]	
CBS	A novel species, *Aspergillus brasiliensis* sp. nov., is described within *Aspergillus* section Nigri. This species can be distinguished from other black aspergilli based on intergenic transcribed region, beta-tubulin and calmodulin gene sequences, by amplified fragment length polymorphism analysis and by extrolite profiles. *A. brasiliensis* isolates produced naphtho-gamma-pyrones, tensidol A and B and pyrophen in common with *Aspergillus niger* and *Aspergillus tubingensis*, but also several unique compounds, justifying their treatment as representing a separate species. None of the isolates were found to produce ochratoxin A, kotanins, funalenone or pyranonigrins. The novel species was most closely related to *A. niger*, and was isolated from soil from Brazil, Australia, USA and The Netherlands, and from grape berries from Portugal. The type strain of *Aspergillus brasiliensis* sp. nov. is CBS 101740(T) (=IMI 381727(T)=IBT 21946(T)).	DNA sequence ITS rDNA: >gb|DQ900597|CBS 246.65|*Aspergillus brasiliensis* strain CBS 246.65 internal transcribed spacer 1, partial sequence; 5.8S ribosomal RNA gene, complete sequence; and internal transcribed spacer 2, partial sequence.| (length of sequence: 465) DNA sequence Beta tubuline: >gb|DQ900607|CBS *246.65*|*Aspergillus brasiliensis* strain CBS 246.65 beta-tubulin gene,partial cds.| (length of sequence: 355)
DSMZ		
VKM		

	Price	Permits/Forms	Keyword(s)	Restrictions
ATCC	$155.00	In addition to the MTA mentioned above, other ATCC and/or regulatory permits may be required for the transfer of this ATCC material. Anyone purchasing ATCC material is ultimately responsible for obtaining the permits. Please click here for information regarding the specific requirements for shipment to your location.		Biosafety Level: 1
CBS	155 EURO		GENBANK/MB510581 *Aspergillus*/*classification/genetics/isolation & purification/metabolism DNA, Fungal/genetics DNA, Ribosomal Spacer/genetics Molecular Sequence Data Phylogeny Polymorphism, Restriction Fragment Length	
DSMZ	65 EURO			Risk group: 1 (classification according to German TRBA)
VKM				Risk group: 4

This was regarding the compatibility of the content (factors 4 and 3). Now about structure of standards, and the level of their compliance in CC catalogues (factors 2 and 1 (Fig. 8).

In OECD documentation, the standards MDS, RDS and FDS are given on each group of MO separately – Filamentous fungi (F), Yeasts (Y), Microalgae, Cyanobacteria, Archaea, Bacteria (B), Plasmids, Protozoa, Phages и Viruses [2], [3], [4]. Of all the groups we examined only F, Y and B, their standards were combined into one in our analysis - so that it was possible to evaluate the overall compliance of catalogues to the standards.

On this picture letters F, Y and B in columns 2 and 4 specify *Organism type* = Fungi (F) or Yeasts (Y), or Bacteria (B). Columns 3 and 5 specify the level of the standards – MDS or RDS or FDS- for each of the field names in column 1, and in the column 6 we combined columns 3 and 5 into one group of standards to make the catalogues data comparable.

Fig. 8: Database fields specified in MDS, RDS and FDS standards for fungi (F), yeasts (Y) and bacteria (B)

NN	1	2	3	4	5	6
1	Accession number	FY	MDS	B	MDS	MDS
2	Other collection numbers	FY	MDS	B	MDS	MDS
3	Restrictions	FY	MDS	B	MDS	MDS
4	Organism type	FY	MDS	B	MDS	MDS
5	Name	FY	MDS	B	MDS	MDS
6	Race	FY	RDS			RDS
7	Status	FY	MDS	B	MDS	MDS
8	Misapplied names/Other names	FY	RDS	B	RDS	RDS
9	History of deposit	FY	MDS	B	MDS	MDS
10	Conditions for growth	FY	MDS	B	MDS	MDS
11	Form of supply	FY	MDS	B	MDS	MDS
12	Isolated from	FY	RDS	B	RDS	RDS
13	Geographic origin	FY	RDS	B	RDS	MDS
14	Mutant	FY	RDS	B	RDS	RDS
15	Sexual state	FY	RDS	B	FDS	RDS
16	Literature	FY	RDS	B	RDS	RDS
17	Infrasubspecific names			B	MDS	-
18	Serovar			B	RDS	RDS
19	Genotype	FY	FDS	B	RDS	RDS
20	Pathogenicity	FY	FDS	B	FDS	-
21	Enzyme_production	FY	FDS	B	FDS	FDS
22	Metabolite_production	FY	FDS	B	FDS	FDS
23	Applications	FY	RDS	B	FDS	FDS
24	Remarks	FY	FDS	B	FDS	FDS
25	Price_code	FY	FDS	B	FDS	FDS
26	Catalogue_entry			B	FDS	FDS
27	Plasmids			B	FDS	FDS

The difference between CABRI and the Best Practice Guidelines standards is in the fields *Infrasubspecific name, Applications* and *Geographic origin*. The field *Applications* was assigned the category F and the field *Geographic origin* to the category M. *Genotype* was assigned the category R. The field *Infrasubspecific names* is a part of the field *Name*, so we ignored it. In most catalogues, the fields *Conditions for growth* and *Recommended temperature* are different, but in the standard they are one field. Looking at the catalogue

presentations at all the 108 web sites and request systems we tried to collect the types of information which they report. Totally we collected 126 relatively similar fields. We call these fields "real". We compared real fields and the fields of MDS+RDS+FDS standard with 184 fields in Darwin Core standard. In Darwin Core we did not find the fields *Restrictions/Toxicity/Pathogenicity, Conditions for growth, Mutant, Race, Serovar, Applications, Price code*, but the field *Geographic origin* is extended to a series of additional fields. Comparison with ABCD was also done. Totally ABCD has more than 1300 fields, the biggest group of items is DataSets/DataSet/Units/Unit/Gathering/ (423 fields) - the elements describing the event and site of collecting a microbial unit - description of the place, geographical data, contact data, pictures, etc.. ABCD also presents a big list of fields with contact data: for institutions and people, which keep the database or the records, or acquired microorganisms – names, phones, E-mails, etc. – in various formats. In ABCD we didn't find the fields *Pathogenicity, Race, Price code*, the field *Applications* is specified but with no definition inside.

The content of on-line catalogues was used to construct a big matrix: 126 real fields make columns and 108 CC catalogues make rows. Each cell of the matrix received the names of the data that the relevant collection has reported according to this real field. The matrix cell is empty if collections do not report the information relevant to the field. With the number of non-empty fields in this table, we calculated the level of compliance of collections to the standards – for all the collections in this study (All), for EMbaRC, for GBRCN and Straininfo – for MDS, RDS, MDS+RDS and MDS minus two fields (*Name* and *Accession number*) separately.

To make the matrix data compatible with the standard, the names of these 126 real fields we combined into 34 «group names» close to MDS+RDS. Group names, real names and the names inside the cells make a matrix of names. Fragments of this matrix for group fields *Geographic origin Applications* are presented on a Fig. 9 and Fig. 10.

We referred the real field to appropriate field in the standard (and to that group name respectively) if the content reported by collections corresponded to this field in the standard. Some of the group fields do not correspond to any standard; they are additional in the group list. We supposed that collection uses a field from the standard if at least one of the real fields reported by collection corresponds to this standard. For every group field we calculated the total number of collections that use it, and divided the result by the number of collections. These data were calculated for all the 108 collections, for EMbaRC, GBRCN and Straininfo separately (Fig. 11).

The average data on each of standards is given on a Fig. 12. Collections with highest level of compliance to MDS+RDS are given on Fig. 13.

Fig. 9: Real names (Country, Geographic origin), group name (_15Geographic origin) which correspond to the *Geographic origin* field

Country	_15Geographic origin	\Country\ Country of isolation \ Country and locality \ Country of origin \Country origin \Country+Region\ Crosby district \Description of Location \District (province) \Habitat \Isolated location\ Isolation country\Isolation Location \Isolation(locality) \Locality \Locality (Date of collection) \Location \Location of Isolation \Province \Site of the isolate \Source country Source location \Substrate location
Geographic origin	_15Geographic origin	\Collect Site \Collection site+Ocean+Sea\ Continent or ocean + State or province \General habitat+Continent \Geographic origin \Geographical details \Geografical origin \Isolation region \Nearest continent \Ocean origin+Region origin \Ocean/Continent+Sea \Origen Geografica \Origin \State+Region (region)

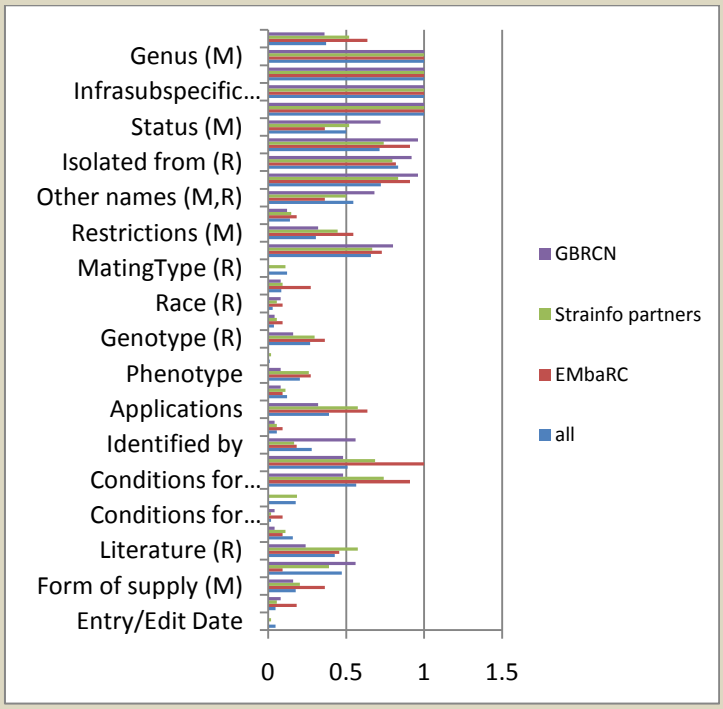
Fig. 10: Real names (Applications, Enzyme production, Metabolites, Transformation), group name (_27Applications) which correspond to the *Applications* field

Applications	_27Applications	\Aplicaciones determinadas \Application \Characterization \Products \Characteristics \Function\Industrial applications \Interest/application \Notes and application \Properties \Property \Research Council Deposit \Special properties+ Recommended for teaching \Remarks \Special features \Special properties
Enzyme production	_27Applications	\Decomposition \Decomposes \Degradation\Chitine synthetase\Enzymes \Enzyme production \Lipolytic \Enzyme electrophoretic profile
Metabolites	_27Applications	Metabolites\Metabolite production\Physiology \Product \Products \Production \Production+Biochemistry/Physiology \Secondary metabolites
Transformation	_27Applications	Assay \Deterioration abilities \Test \Tests \Testing \Transformation

Conclusions

The **Figs. 11-13** show that the calculated compliance with the standards is approximately 65% for MDS and 30% for RDS. The scope=100% is for the fields *Name* and the *Numbers of culture* only. The answer to user request on any other field can cover not more than the half of the total space in accumulated catalogues database, and this is only the upper level. Most likely, it is overestimated: here and we could not take into account the percentage of use in the real fields referred to the standards. And because of the differences in the content of identical fields in CC catalogues (example in **Fig. 7**) and differences in typing, the actual coverage can be 10 or 100 times less.

Fig. 11: The percentage of collections that use the fields of BRC standards: MDS (M) and RDS (R)



Acknowledgements

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Fig. 12: The average scope of MDS+RDS fields in CC catalogues reported

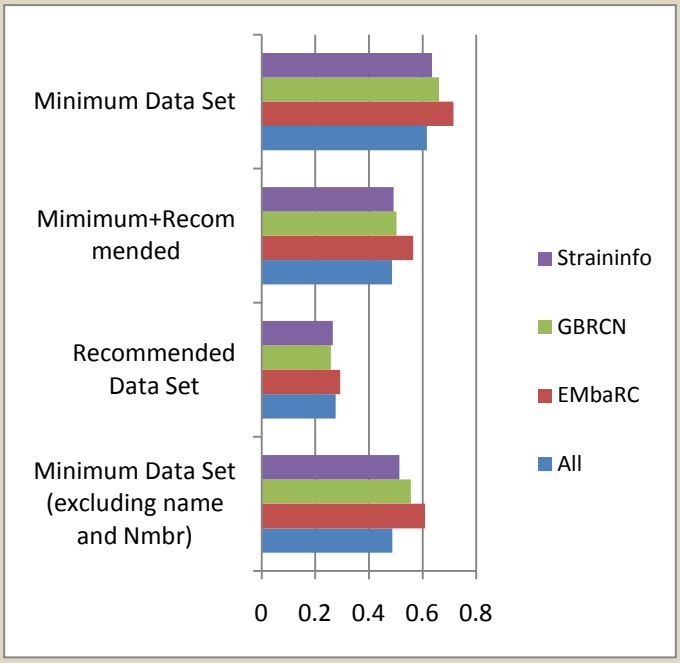
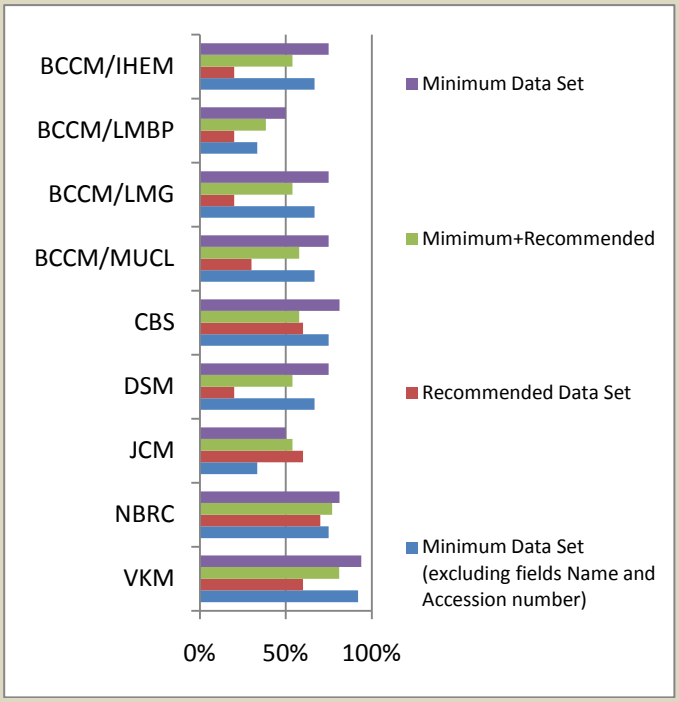


Fig. 13: Culture collections with the highest level of compliance to MDS+RDS standard



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The Industrial Biotechnology Study Centre Wild Type Culture Collection

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INTRODUCTION

The Culture Collection of the Industrial Biotechnology Study Centre (CCEBI's culture collection) was created in 1998 and it's located at Universidad de Oriente, in Santiago of Cuba province. Its main objectives are directed towards supplying and preserving wild type strains to be used in teaching and research activities at the university where it is located and in other research institutions in Santiago of Cuba province. Since its creation, it has been member of the Cuban National Group of Culture Collections and also associated to the Latin American Federation for Culture Collections (FELACC).

Fig. 1: CCEBI's Culture Collection is placed on Santiago of Cuba city.

STRAIN BANK STRUCTURE

It preserves 142 strains of bacteria (24%), molds (43%), yeasts (24%) and microalgae (9%), ninety percent of those isolates are wild-type strains deposited by research institutes placed on Santiago of Cuba province. The resting ten percent are reference strains for teaching purposes. Bacterial wild-type strains are used for microbial tensoactives production, biological control of plant pathogen fungi, plant growth promoting activities, immunological quality control of biotechnological processes and petroleum and oil residues treatment. Molds are used for food and enzymes production (edible mushrooms), agriculture residues treatment and biological control of plant pest. Yeast strains are used for ethanol and enzymes production and for lignocellulosic and pectinolytic residues treatment.

The wild-type strains of major interest are: the yeast *Kluyveromyces marxinaus* EP-915, CCEBI 2011, CECT 11769. It was isolated from coffee (*Coffea* spp.) processing solid residues and it produces poligalacturonase enzymes and ethanol. This microorganism was deposited for legal protection purposes in the Spanish Type Culture Collection (CECT). Also, bacteria strain *Pseudomonas aeruginosa* AT10, CCEBI 1039, CECT 5872 and *Pseudomonas aeruginosa* AT18, CCEBI 1044. The strain AT10 was isolated from soybean residues contaminated soils and it

produces rhamnolipids and PHB, degrades n- alkenes and it grows on soybean, sunflower and mineral oils, as well as petroleum and kerosene. It was deposited on the CECT for free access. The strain AT18 was isolated from hydrocarbons polluted soils from the petroleum refinery industry *Hermanos Días*, located in Santiago of Cuba city. It degrades petroleum in more than an eighty percent and absorbs metallic ions as cupper, manganese and zinc.

Fig. 2: *Pleurotus ostreatus* CCEBI 3024 culture on coffee pulp (*Coffea* sp.) agriculture residues

STRAINS PRESERVATION

For microorganism's preservation the culture collection was organized into a *strain work bank* (WB) and in a *strain preservation bank* (PB). The strains belonging to the WB have been usually used for teaching activities and they are preserved by active subculture in a commercial freezer at 4°C, at four copies by each one. The whole strains are maintained in the PB through short - time preservation techniques as follows:

- *Bacteria* are preserved in a commercial freezer with glycerol (10% vol/vol). Transferences are carried out once a year.
- *Yeasts* are maintained in sterile distilled water at 4°C. Transferences are carried out every twenty four months.
- *Molds* spores and mycelium are preserved in sterile distilled water at room temperature and in glycerol (10% vol/vol) at 4°C respectively. Spore in distilled water viability control is carried out once a year and mycelium in glycerol is transferred every eighteen months.

Fig. 3: Vegetal macerates from pectinolytic wild type yeast strain *Kluyveromyces marxianus* EP-915, CCEBI 2011 (**C** *control*, **T** *treated*)

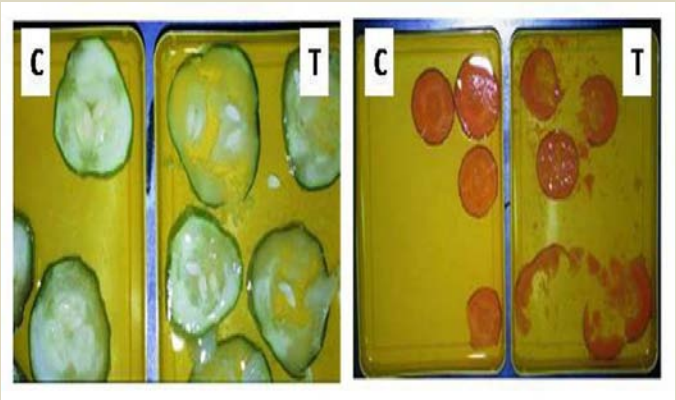
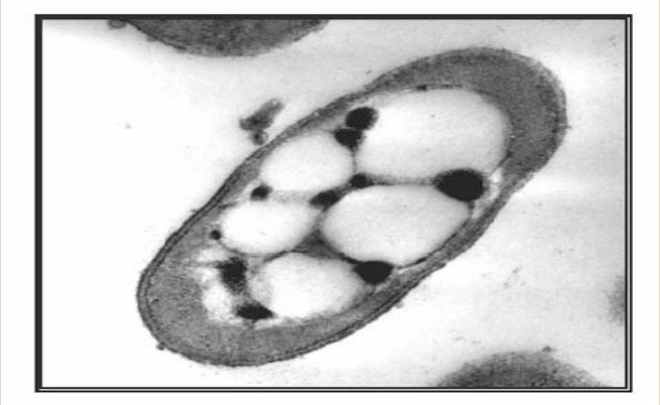


Fig. 4: *Pseudomonas aeruginosa* AT10, CCEBI 1044 showing PHB and rhamnolipids inclusions



INFORMATION MANAGEMENT

Strains data is stored in a file containing the following documents:

- *Strains Deposit Standards:* It has the rules necessary for strains deposit at CCEBI's culture collection.
- *Schedule for Strains Shipment:* It has the main information about the management and strain preservation, as its generals. It is added at each dispatched microorganism.
- *Technical Register:* It relates to the whole technical information corresponding to each strain. This information is automated in a Database supported by Microsoft Office Access software. The data stored are: *species name*, *CCEBI´s code*, *original code*, *strain origin*, *reference code* (for reference strains), *number of transferences*, *date of last transference*, *optimal preservation conditions* (culture

media/temperature), *preservation culture media*, *optimal growth medium*, *sporulation medium* (if corresponds), *optimal growth temperature*, *biochemical features* (for taxonomic purposes), *strain purposes*, *transference's frequency recommended*.

SCIENTIFIC AND TECHNICAL RESULTS

CCEBI's culture collection has been supported by educational and scientific institutions of Cuba. Also, it has received bibliography and reference strains contribution from the Spanish Type Culture Collection and other international research institutions. At the same time, it has contributed directly to the execution of doctoral thesis and to a great number of other research works in Biological Sciences, Pharmacy and Chemistry specialization at graduate and postgraduate level.

Table 1: Research projects supported CCEBI's culture collection

Research Projects Executed	Founded	Years
Biotechnological interest in microorganism's preservation by freezing techniques	Higher Education Ministry (MES, Cuba)	2000-2002
CEBI´s Culture Collection: strains bank for the agriculture biotechnology development in the region	Science, Technology and Environmental Ministry (CITMA, Cuba)	2001-2003

Our results have been published as monographs, technical documents, scientific events and papers. Research projects executed are referred in Table 1, papers and publications are resumed in Table 2.

The Science, Technology and Environmental Medium Ministry and the Universidad de Oriente have recognized our main results with the following distinctions:

- *Premium to the Result of Major Contribution to the Environmental Protection*. Orient University Balance of Science and Technological Innovation (2004)
- *Provincial Premium of Technological Innovation*. Ministry of Science Technology and Environmental Medium of Cuba (2007)

Table 2: Reports of events and papers publications

Events	Publications
Collection and Preservation Microorganisms of Biotechnological Interest	Orberá T., Pérez I., Serrano M. (2003). *Creación y conservación de colecciones de cultivos microbianos.* Monograph, UO Eds. Santiago de Cuba [ISBN 959-207-121-7]
2nd National Workshop of Culture Collections, Tropical Medicine Institute Pedro Kourí (Havana, 1999)	
17th Chemistry International Conference. Orient University (Santiago of Cuba, 2002) *The Edible Mushrooms Culture Collections of the Industrial Biotechnology Study Centre*	Orberá T., Serrano M., Serrat M., Abalos A., Bermúdez R.C. (2002). *Collection and Preservation of Strains for Environmental Biotechnology*. 17ma Conferencia de Química. UO Eds, Santiago de Cuba [ISBN 959-207-083-0]
3rd Latin American Mycology Congress, University Simón Bolívar – National Centre of Scientific Research(Caracas, 1999) *Growth evaluation of edible mushrooms strains Pleurotus* spp*. on Coffee Pulp Agar Extract to the Preservation and Primary Spawn Culture*	Orberá T., Pérez I., Serrano M., Heredia J. (2003). *Preservation of Microbial Resources for Biotechnology, Food and Agriculture in the Territory*). Jornada Científica Facultad de Ciencias Naturales. UO Eds, Santiago de Cuba [ISBN 959-207-093-8]
4th International Conference on Mushroom Biology and Mushroom Products (Cuernavaca, 2002)	
2nd International Workshop CUBACAFE´ 2002. Coffee and Cocoa Researches Central Station – CUBACAFE *Collection and Preservation of Strains of Interest for Environmental Biotechnology*	Orberá T. (2004). *Molecular Identification Methods of Yeasts of Biotechnological Interest*. Revista Iberoamericana de Micología. Vol. 21 (1):15-19
4th National Workshop of Culture Collections. National Institute of Hygiene, Epidemiology and Microbiology (INHEM)(Havana, 2003).	Orberá T. (2004). *Yeasts harmful action on foods*. Revista Cubana de Salud Pública. Vol. 30 (3)

FINAL CONSIDERATIONS

The Industrial Biotechnology Study Centre culture collection is the only one existing in the west of Cuba registered amongst national and regional culture

collections databases, such as the Latin America Federation for Culture Collections (FELACC). It has been a reference centre for collection and preservation of microorganisms with industrially and environmentally significant biotechnological potential. Also, it supplies services to assist with teaching about culture collections and biosafety themes at graduate and postgraduate educational levels. Its potential is in building and expanding the collection of beneficial indigenous organisms for better research service, development and teaching here, at our institute and in the west region of Cuba.

French Network of Biological Resources Centres for Microorganisms, France (FBRCMi)

In the current context "microorganisms" mean microscopic organisms such as viruses, bacteria, cyanobacteria, yeasts, filamentous fungi, protozoa and protists, as well as their replicated parts and other derived materials (genomes, plasmids, DNA for example).

The Biological Resource Centres (BRCs) of microorganisms are responsible for preservation, production, control and distribution of microorganisms according to OECD Best Practices Guidelines (quality, control, bio-safety…) for Biological Resource Centres (2007). They are essential research infrastructures in living sciences, contributing among others to the progress in biotechnologies, health and agriculture.

The French Network of Biological Resource Centres for Microorganisms (FBRCMi) merges presently around 9 Biological Resource Centres from different institutions. It is a real research and development tool owing to the amount and diversity of preserved resources.

This new network consists at present of following BRCs:

- The Biological Resource Centre of the Institut Pasteur (CRBIP)
- Biological Resources Centre of Leishmania (CRB-Leish, Hospital University Centre and University of Montpellier 1)
- Biological Resource Centre Toxoplasma Biological Resource Centre Toxoplasma (French University Hospitals Limoges and Reims)
- The International Centre of Microbial Resources of INRA (CIRM-INRA)
- The BRC Oenology (Institute of Vine and Wine Science, University Victor Segalen Bordeaux 2)
- GenoSol Platform, INRA-University of Bourgogne, Dijon
- Environmental Biological Resources–Environment and Microbiology Group, UMR IPREM 5254, Université de Pau et des Pays de l'Adour
- The National Collection of Microorganisms of the Wine and Vine French Institute (is currently distributed on 5 different sites: Beaune, Nantes, Tours, Villefranche and Nimes).
- The «Environmental Microbiology Lyon» (EML) Biological Resource Centre (BRC)

To represent this French Network of Biological Resources Centres for «microorganisms», the website http://www.fbrcmi.fr was recently created.

A project of common catalogue for the FBRCMi, considering the problem of interoperability, is also in progress.

ECCO News

30th ECCO Annual Meeting

The European Culture Collections' Organization (ECCO) held its 30th Annual Meeting in Utrecht, the Netherlands, on June 16-17, 2011. The meeting was organized by the CBS curators and the ECCO board. With 71 participants from 22 countries it was the best attended annual meeting since the foundation of ECCO in 1981. Like previous meetings, it brought together curators and other scientists from culture collections throughout Europe to exchange the latest research, novel methods for strain identification and preservation, and to build networks and share ideas about the challenges faced by the collection community.

The venue for this year's meeting was Hotel Mitland, a choice much appreciated by the participants for the green surroundings and the historical fortress 'De Bilt' close to the city centre of Utrecht. The detailed program of the meeting can be viewed on the ECCO website (www.ecco-site.org), from where presentations can also be downloaded.

CBS Director Pedro Crous and ECCO President Daina Eze opened the meeting on Thursday morning. In the first session on phylogeny and taxonomy of microorganisms, talks were presented by Pedro Crous on the challenges faced by BRC's in species discovery in the Fungal Kingdom, and by Dominique Clermont (Institut Pasteur) who evaluated mass spectrometry and gene sequence data in *Propionibacterium acnes*. Thomas Friedl (SAG) talked about Green Algal taxonomy, the significance of the algal collections, and challenges these collections face to maintain these important organisms. Laurence Lessage-Meessen (INRA) presented work on high-throughput screening of laccase activities and the use of the laccase gene as a phylogenetic tool in *Pycnoporus*. Session 2 dealt with the latest developments in databases, with contributions by Stéphanie Weiss (INRA) on the YeastIP database, John Day on the CCAP Knowledgebase, David Smith (CABI) about the key role of information resources in BRC networking initiatives. Peter Dawyndt (Ghent University) gave a stimulating view on future developments of data sharing and integration. In Session 3 Dagmar Fritze (DSMZ) briefly introduced the Convention on Biological Diversity Nagoya protocol for Access and Benefit Sharing (ABS). Thom Dedeurwaerdere (Louvain University) talked about possible strategies to govern global exchange of microbial material from a legal perspective, followed by some case examples presented by Claudine Vereecke (BCCM-LMG). This session was concluded with a round table discussion on the consequences of ABS for microbial research and BRC operation. Strategies that could influence the decisions national authorities will take on governing microbial exchange were discussed. In the last session on collection network activities WFCC President Philippe Desmeth talked about the recent re-launch of the new WDCM, Danielle Janssens (BCCM-LMG) presented highlights in ECCO's 30 year history and recent developments, Pekka Oivanen (HAMBI) introduced the MICCO network of Finnish BRC's, and David Smith talked about the Microbial Resource Research Infrastructure (MIRRI), as proposed by the consortia of ECCO, the European consortium of Microbial Resources Centers (EMbaRC) and the Global Biological Research Centre Network demonstration project (GBRCN). This initiative was recently recommended for the ESFRI Road Map. Erko Stackebrandt introduced the EMbaRC initiative that aims to stimulate the deposit in public culture collections of strains used in scientific studies. Possible mechanisms and strategies to achieve this goal were discussed.

The delegates visited the CBS building on Thursday evening, where the conference dinner was also held. Joost Stalpers, who retired May 2011 after three decades of CBS curatorship, was addressed by former ECCO president Dagmar Fritze, thanking him on behalf of the entire ECCO community for his many contributions to the mission of ECCO.

On Friday morning the program continued with a session on collaborations between culture collections and industrial partners. Rolf Boesten (CBS), Cristina Varese (MUT), Agnieszka Korzeniowska-Kowal (PCM) and Daina Eze (MSCL) presented very interesting examples of such collaborations. The last session dealt with methods for strain identification and validation. Kees Maquelin (River Diagnostics) spoke about the potential of Raman Spectroscopy, and Cledir Santos (MUM) focused on MALDI-Tof. Ronald de Vries (CBS) gave a presentation on the potential of fungal physiological traits for identification purposes. Marta Simões (MUM) concluded this session with presenting the recently established quality management system at MUM.

In the Annual General Meeting new ECCO membership applications were accepted for the Scandinavian Culture Collections of Algae & Protozoa (SCCAP, University of Copenhagen), the Culture Collection of Algae at the University of Cologne (CCAC). After the official business of the AGM, poster prizes were awarded to the three best posters presented viz., third prize to Célia Soares *et al*., second to Sashka Mihailova *et al*., and first prize to Marília Maciel *et al*. Later that day many participants joined in for a guided tour through Utrecht city centre, enjoying the famous Dom tower and many other historic sites. Many also joined for an informal dinner with complementary drinks on behalf of CBS and GBRCN.

Many ECCO delegates also stayed for a special meeting on Saturday 19th, organized by GBRCN, where the preparations for MIRRI were discussed.

Preparations are already made for the next ECCO meeting, to be held in Braga at the Micoteca Universidade do Minho (MUM), in June 2012.

Gerard Verkley and Daina Eze

ANNOUNCEMENTS AND LINKS

http://www.cbd.int/icnp1/submissions/

http://www.cbd.int/abs/doc/protocol/icnp-1/wfcc-en.pdf

CONFERENCES AND WORKSHOPS

1] On February 3, 2011, the Fungal Genetics Stock Centre, in cooperation with the University of Missouri-Kansas City School of Biological Sciences, hosted the inaugural Midwestern Universities Filamentous Fungal Symposium.

This one-day event included participants from over ten universities in Kansas, Arkansas, Nebraska, Illinois, and Missouri. This symposium included five talks and a poster session sponsored by Boulevard Brewery and culminated with a lecture by Professor N. Louise Glass from the University of California- Berkeley. Emphasizing interactions between students and post-doctoral scientists, this event included a tour of the FGSC and a pizza lunch for students to meet the keynote speaker. Planning is underway to build upon the success of the 2011 symposium in years to come.

For more information see www.fgsc.net/muffs2011.htm

2] FGSC staff is leading sessions on Strain Preservation at the 2011 *Fusarium* Laboratory Workshop being held at Kansas State University.

See http://www.plantpath.ksu.edu/p.aspx?tabid=623

There will be an afternoon workshop entitled "Microbial Collections: Practice and Management" at the 2011 joint meeting of the American Phytopathological Society and the International Association for the Plant Protection Sciences. This workshop is co-sponsored by the APS Collections and Germplasm and Mycology committees and will include presentations on identification, maintenance, preservation and distribution of fungi, bacteria, and plant viruses. Addition content will emphasize informatics and collection management especially with regard to best practice guidelines.

For more information see: http://www.apsnet.org/meetings/annual/program/Pages/Workshops.aspx

3] The Fungal Genetics Stock Centre is happy to announce the promotion of Mr. Aric Wiest, MS to the position of Associate Curator. Mr. Wiest received his post graduate degree at the Texas A&M University where he worked with Prof. Charles Kennerly on the biology of non-ribosomal toxin synthesis in *Trichoderma*.

4] The US National Science Foundation has delayed the submission date for their long-running Living Stock Collection for Biological Research program and anticipates a fall 2011 deadline. The delay is due to the merger of the LSCBR program with the Improvements to Biological Research Collections program.

This re-evaluation is being made in regard the policy statement published by the US Office of Science and Technology Policy on behalf of the President of the United States. This statement was issued in October 2010 and referenced the Interagency Working Group on Scientific Collections. Three action items were cited in the statement: Budgets should be prepared so that collections are not compromised. Best practice guidelines should be developed and implemented, and collections should make their catalogues available online.

For more information see: http://www.fgsc.net/OSTP%20collections%20memo%20final.pdf and http://www.whitehouse.gov/sites/default/files/sci-collections-report-2009-rev2.pdf.