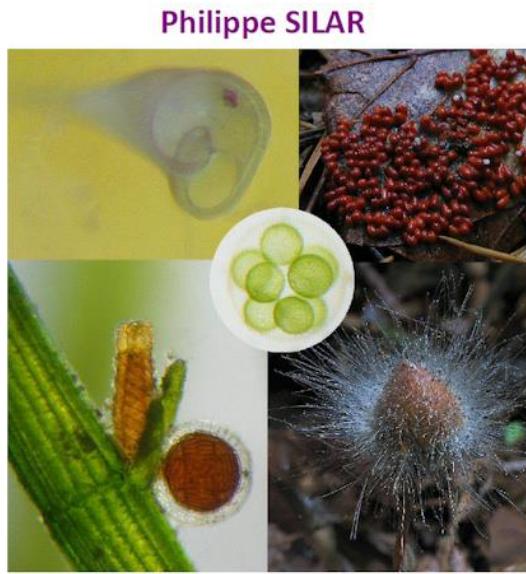


Mise en collection des champignons

Philippe silar: <http://gec.sdv.univ-paris-diderot.fr/>



Qui fait des collections fongiques et pourquoi?

- **Les collections institutionnelles publiques**
- **Les laboratoires de recherches**
- **Les industriels**

Des collections publiques

- à visée de préservation et pour servir de référence pour des études futures

The screenshot shows the ATCC website's main navigation bar and a featured section for 'Fungi and Yeast'. It highlights the 'LGC' partnership and offers to search for fungal and yeast isolates.

This page from the INRA Fungal Genetics Stock Center features a large image of a petri dish with fungal colonies. It includes links for 'Fungal Genetics Stock Center', 'Fungal Genetics Reports', and 'Meeting Information'.

The CBS-KNAW Collections website displays a banner for 'The World's Largest Fungal Culture Collection'. It includes sections for 'Search & Buy Fungal Collection', 'Search & Buy Bacteria Collection', and 'Search & Buy Plasmids Collection'.

The CIRM-levures website features a header with logos for INRA, ISO, Agence Nationale de la Recherche, and Université d'Angers. It includes sections for 'Qui sommes nous ?', 'Bactéries d'intérêt Alimentaire', 'Bactéries Pathogènes', 'Champignons Filamenteux', and 'CFBP - Bactéries associées aux Plantes'.

The BBF-Biotecnologie Biotechnologie Fongiques website features a banner for 'Le CIRM-CF, socle des recherches de l'Unité'. It includes sections for 'Platfroms', 'Biomasse fongique', and 'Annuaire'.

The Souches Fongiques website shows a close-up image of a petri dish with red bacterial colonies. It includes sections for 'Accès à la collection', 'SOUCHE FONGIQUE', and 'ACCÈS À LA COLLECTION'.

The DSMZ website features a banner for 'Leibniz-Institut DSMZ-Deutsche Sammlung von Mikroorganismen und Zellkulturen GmbH'. It includes sections for 'HOME', 'ABOUT US', 'RESEARCH', 'CATALOGUES', 'DEPOSIT', 'SERVICES', 'SHOP', 'SUPPORT', 'CONTACT', and 'FAQ'.

The BCCM-MUCL website features a banner for 'GREAT AT SMALL THINGS'. It includes sections for 'About BCCM', 'Sectors', 'News', 'Prices/Fees', 'Legal Issues', and 'Videos/Links'. It also mentions the 'BCCM-MUCL Environmental and Applied Mycology' initiative.

The CABI website features a banner for 'Improving lives by solving problems in agriculture and the environment'. It includes sections for 'About CABI', 'Development and Research', and 'Publishing'. A sidebar for 'Culture collection' shows a gloved hand holding a test tube.

les collections publiques sont répertoriées dans le WFCC:

The screenshot shows a web browser window with the URL www.wfcc.info/ccinfo/collection/. The page title is "Culture Collections Information Worldwide". The navigation bar includes links for Home, Browse, Search, and Statistics. Under the Browse section, there are links for By Country, By Region, and By Acronym. The By Region link is highlighted, showing categories D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z. The By Acronym link is also highlighted, showing examples Argentina, Armenia, Australia, and Austria. A message indicates "There are 14 collections in Argentina". A table lists 14 collections from Argentina, each with an acronym, WDCM number, collection name, and region. The table rows are as follows:

Acronym	WDCM Number	Collection	Region
BGIV	WDCM 962	Banco de Glomeromycota In Vitro (Bank of Glomeromycota In Vitro)	America
BNM	WDCM 938	Banco Nacional de Microorganismos (National Bank of Microorganisms)	America
CCM-A	WDCM 29	Coleccion de Cultivos Microbianos	America
CEP	WDCM 973	Entomopathogenic Fungal Culture Collection of Argentina	America
CICV	WDCM 33	Centro de Investigaciones en Ciencias Veterinarias	America
CPZ	WDCM 275	Centro Panamericano de Zoonosis	America
CRL	WDCM 614	Centro de Referencia Para Lactobacilos	America
DMic	WDCM 1115	Culture colection of biomedical interest fungal	America
ICFC	WDCM 826	IIB-INTECH Collection of Fungal Cultures	America
IMYZA	WDCM 31	Instituto de Microbiología y Zoología Agrícola	America
LEEIFCVETUBA	WDCM 1065	LABORATORIO ESCUELA DE ENFERMEDADES INFECCIOSAS	America
LJC	WDCM 904	Colección de fitopatógenos de cultivos hortícolas	America
LPSC	WDCM 1001	La Plata Spegazzini Collection	America
PROIMI	WDCM 587	Planta Piloto de Procesos Industriales Microbiológicos	America

Copyright © 2011
World Data Center for Microorganism

infrastructure dédiée à l'entretien des souches : collections pérennes

possèdent un site Web où il est possible d'acheter les souches

coût variable en fonction des collections (20-500€)

nécessité parfois de signer des « accords de transfert »

Des laboratoires comme par exemple le mien!

Pour préserver nos souches sauvages et mutantes

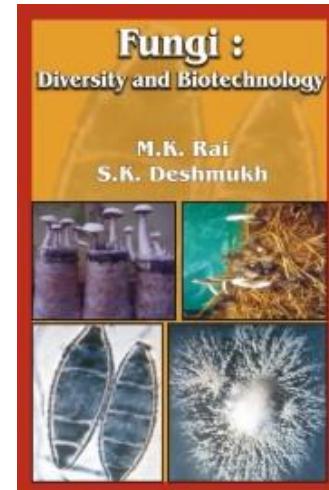
stocks.xls [Mode de compatibilité] - Microsoft Excel

BOITE AE1

souche	espèce	épithype	date de mise en RGS	origine
b2-94-A1fm-mut1				
b2-94-A1fm-mut1				
b2-94-A1fm-mut1				
c6-FE20	<i>Aspergillus immersus</i>	b2-94-A1fm+2 Hfm+	début 2001	L. Belcier
F93				
FB4				
FDX7				
FDX8				
GD-15-9				
GD-FE21				
GD-FE22				
GD-FE23				
GD-FE24				
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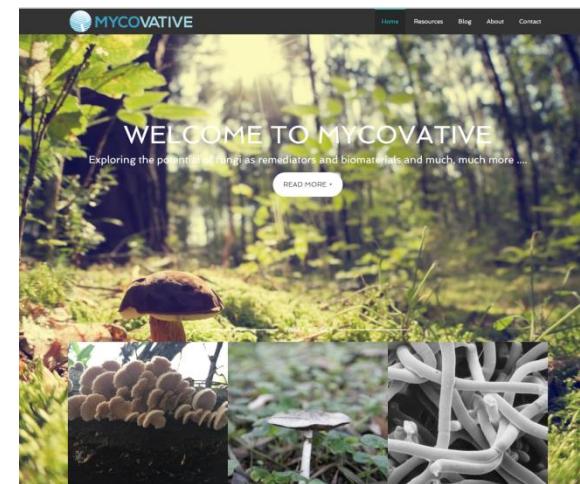
Les industriels :

- Intérêts technologiques et financiers
- Pas accessibles au grand public



The homepage of Mycovative features a dark green header with the company logo and navigation links for Home, About, Materials, How It Works, Blog, Contact, and Sample Store. The main headline 'We Grow Materials' is centered in a large, white, sans-serif font. Below the headline, there's a sub-headline 'Ecovative is...' followed by a brief description of the company as a world-leading biomaterials company. A 'Featured Materials' section shows a stack of wooden-looking panels labeled 'Mycoboard'.

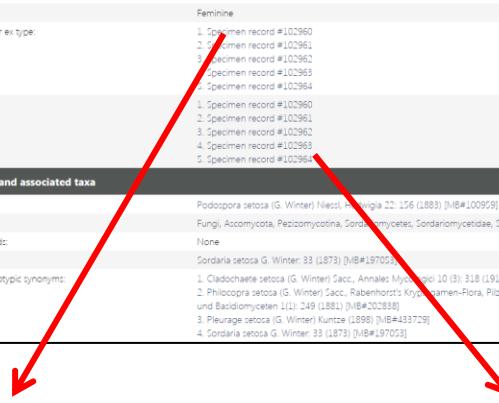
A detailed page from the Mycovative website about their 'Mycoboard' product. The heading 'Featured Materials' is at the top. Below it, there's a large image of a stack of Mycoboard panels. To the right, there's a detailed description of the product: 'Mycoboard' is a composite material made from mycelium and plant-based materials, used as a replacement for particleboard, plywood, and fiberboard. It's described as being manufactured using natural resin instead of harmful resins. Below the description is a 'LEARN MORE' button.



Qu'est-ce qui est mis en collection?

- des mycéliums vivants ou des spores dormantes de souches sauvages récoltés par les mycologues

<i>Podospora setosa</i>	
General information	
Summary:	<i>Podospora setosa</i> (G. Winter) Niedl., Hedwigia 22: 156 (1889) [MB#100959]
Synonymy:	# <i>Sordaria setosa</i> (G. Winter) 33 (1873) [MB#197053] # <i>Philocarpa setosa</i> (G. Winter) Sacc., Rabenhorts Kryptogamen-Flora, Pilze - Schizomyceten, Saccharomyzeten und Basidiomyceten 1(1): 249 (1881) [MB#202838] # <i>Pleurae setosa</i> (G. Winter) Kunze (1898) [MB#433729] # <i>Cladochaete setosa</i> (G. Winter) Sacc., Annales Mycologici 10 (3): 318 (1912) [MB#160211]
Mycobank #:	100959
Epithet:	setosa
Rank:	sp.
Authors:	(G. Winter) Niedl.
Authors (abbreviated):	(G. Winter) Niedl.
Literature:	Niedl, G. von, 1883. Über die Theilung der Gattung <i>Sordaria</i> . Hedwigia, 22:153-156
Page #:	156
Year of publication:	1883
Name type:	Combination
Gender:	Feminine
Type specimen or ex-type:	1. Specimen record #102960 2. Specimen record #102961 3. Specimen record #102962 4. Specimen record #102963 5. Specimen record #102964
More specimen:	1. Specimen record #102960 2. Specimen record #102961 3. Specimen record #102962 4. Specimen record #102963 5. Specimen record #102964
Classification and associated taxa	
Current name:	<i>Podospora setosa</i> (G. Winter) Niedl., Hedwigia 22: 156 (1889) [MB#100959]
Classification:	Fungi, Ascomycota, Pezizomycotina, Sordariomycetes, Sordariomycetidae, Sordariales, Laciophaeiaceae, Podospora
Associated records:	None
Basionym:	<i>Sordaria setosa</i> G. Winter: 33 (1873) [MB#197053]
Obligate or homotypic synonyms:	1. <i>Cladochaete setosa</i> (G. Winter) Sacc., Annales Mycologici 10 (3): 318 (1912) [MB#160211] 2. <i>Philocarpa setosa</i> (G. Winter) Sacc., Rabenhorts Kryptogamen-Flora, Pilze - Schizomyceten, Saccharomyzeten und Basidiomyceten 1(1): 249 (1881) [MB#202838] 3. <i>Pleurae setosa</i> (G. Winter) Kunze (1898) [MB#433729] 4. <i>Sordaria setosa</i> G. Winter: 33 (1873) [MB#197053]



Specimen record #102960	
Mycobank Typification #(MBT):	102960
Identified as:	<i>Podospora setosa</i>
Taxon name:	<i>Podospora setosa</i>
Herbarium records:	CBS H-17284
Collected by:	R.F. Cain
Location details:	Tamsel
Country (state):	Germany
Substrate detail:	dung of dog

Specimen record #102964	
Mycobank Typification #(MBT):	102964
Identified as:	<i>Podospora setosa</i>
Identified by:	G.S. de Hoog
Taxon name:	<i>Podospora setosa</i>
Herbarium records:	CBS H-17288
Collected by:	G.S. de Hoog
Collector's number:	76
Collection date:	04/11/1968
Location details:	Baarn, Groeneveld
Country (state):	The Netherlands
Substrate detail:	rabbit dung

Descriptions	
Description:	<i>Podospora setosa</i> (Winter) Niedl. 1883; Hedwigia, 22: 156. / in Matsushima (1975), p. 181.
Link out to external resources	
Other fungal links:	Catalogue of Life (CoL) Encyclopedia of Life (EOL) Global Biodiversity Information Facility (GBIF) Index Fungorum (IF) Integrated Taxonomic Information System (ITIS)
Bibliography link:	Google Scholar PubMed
General link:	Google Wikimedia Wikipedia Wikispecies
Molecular link:	BOLD Systems EMBL NCBI
Specimens and strains link:	All Russian Collection of Microorganisms (VKM) CBS collection Catenulo
Files	
Associated files:	
<p>2-626 (1) <i>Podospora setosa</i> F1065 P1861 P1862 P1863 P1865 P1866 Record F8703 100 μm 50 μm</p>	

- des souches mutantes ou améliorées pour des applications biotechnologiques

souches mutantes de Podospora anserina



dans notre collection plus de 1 000 mutants

Et les sporophores?

Les « vouchers » sont séchés, numérotés et stockés dans des « herbariums »

 **NORTH AMERICAN
MYCOLOGICAL ASSOCIATION**
Promoting, pursuing and advancing the science of mycology

Member Log In Password Submit
Trouble logging in?
Search...

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NAMA Voucher Collection Project

The North American Mycological Association is uniquely positioned to make a signature contribution to the field of mycology. As an organization spanning an entire continent, NAMA can offer the scientific community thousands of specimens of a wide range of fungi collected — from regions and habitats of North America from the forests of the Appalachians, Rocky Mountains and Pacific coast, to the boreal forests of Canada, the Midwest oak woodlands, and the coastal plain of the Gulf.

Every year for several days, scores of NAMA members scout out hundreds of fungi from varied habitats within a broad geographic area surrounding the annual foray site. One specimen — a voucher specimen — of each species identified by an expert amateur or professional, is photographed, recorded, and, after being displayed, is dried and accessioned into the herbarium of the Field Museum of Natural History, the repository of NAMA's several thousand voucher specimens representing hundreds of fungi species.


Roger Rosentreter talks about lichens at Sunday wrapup


Chroogomphus pseudovinicolor, vouchered specimen 226

Canadian Forest Service
Pacific Forestry Centre, 506 W Burnside Road, Victoria BC V8Z 1M5

Herbarium DAVFP Collaborator Collection Slip

Name of Fungus:
(Latin binomial and authority)
Reference:

Location:
Date Collected: (d/m/y) **Lat.** **Long.**

Host species or substrate:

Collected by - Name:
Address:
Phone No:

Identified by - Name:
Address:

Observations/Comments:

HERBARIUM INFORMATION

Accession Code:
DAVFP No.:
Species Code:

Observations/Comments:

Il est possible d'extraire de l'ADN, mais les tissus sont généralement morts...

Malgré tout, le nombre de souches présentes dans les collections est restreint

1000 Fungal Genomes

This project aims to provide genomic information for every family of fungi. The list below includes sequenced fungal genomes, those in progress, and selected nominations. You can log in and nominate new species for genome sequencing in the families with no (green) or only one (yellow) reference genome if you can provide DNA/RNA samples for their sequencing (see JGI User Guidelines). If you know additional fungal species being sequenced somewhere but not reflected on this list, please register these projects in GOLD (use Add to GOLD link) or let us know.

Phylum	Subphylum	Class	Order	Family	Genome Projects
all	all	all	all	all	Search Reset
Found 713 families, 1251 genome project(s), 501 nomination(s).					
The species that have been nominated for sequencing by community are marked with asterisk.					
Phylum name	Subphylum name	Class name	Order name	Family name	Genome Projects
Ascomycota	Incertae sedis	Incertae sedis	Incertae sedis	Incertae sedis	<p><i>Ascomycete</i> sp. <i>Calcarosporiella thermophila</i> <i>Cerataphis brasiliensis</i> yeast-like symbiont <i>Helminthosporium solani</i> <i>Nilaparvata lugens</i> yeast-like symbiont <i>Stangermonium griseum</i> <i>Symbiaphrina kochii</i> <i>Taxomyces andreaeae</i></p> <p>GOLD: Whole Genome Sequencing GOLD: Whole Genome Sequencing</p> <p>Add to GOLD</p>
Ascomycota	Pezizomycotina	Arthoniomycetes	Arthoniales	Arthoniaceae	<p><i>Arthonia rubrocincta</i></p> <p>GOLD: Whole Genome Sequencing</p> <p>Nominate Add to GOLD</p>
Ascomycota	Pezizomycotina	Arthoniomycetes	Arthoniales	Chrysotrichaceae	<p>None sequenced</p> <p>Nominate Add to GOLD</p>
Ascomycota	Pezizomycotina	Arthoniomycetes	Arthoniales	Roccellaceae	<p>None sequenced</p> <p>Nominate Add to GOLD</p>
Ascomycota	Pezizomycotina	Arthoniomycetes	Incertae sedis	Melaspileaceae	<p>None sequenced</p> <p>Nominate Add to GOLD</p>
Ascomycota	Pezizomycotina	Dothideomycetes	Acrospermales	Acrospermaceae	<p><i>Acrospermum compressum</i> * <i>Oomyces cameoalbus</i></p> <p>GOLD: Whole Genome Sequencing nominated</p> <p>Jon Magnuson, Pacific Northwest National Laboratory Manfred Binder, CBS KNAW</p> <p>Add to GOLD</p>
Ascomycota	Pezizomycotina	Dothideomycetes	Botryosphaerales	Bagnisiellaceae	<p>None sequenced</p> <p>Nominate Add to GOLD</p>
Ascomycota	Pezizomycotina	Dothideomycetes	Botryosphaerales	Botryosphaeriaceae	<p><i>Aplosporella prunicola</i> <i>Botryosphaeria dothidea</i> <i>Diplodia pinea</i> <i>Lasiodiplodia theobromae</i> <i>Macrophomina phaseolina</i> <i>Microdipodina sp. AK1800</i> <i>Neofusicoccum parvum</i></p> <p>GOLD: Whole Genome Sequencing GOLD: Whole Genome Sequencing GOLD: Whole Genome Sequencing GOLD: Whole Genome Sequencing GOLD: Whole Genome Sequencing nominated GOLD: Whole Genome Sequencing GOLD: Whole Genome Sequencing</p> <p>Jana URen, University of Arizona</p>



le projet de séquence de 1000 génomes fongiques a du mal à trouver les souches à séquencer car les collections ne possèdent pas de cultures pour de nombreuses familles...



... la raison en est qu'il n'existe souvent plus de mycologues qui les étudient actuellement! et que...

... la diversité des champignons est immense !



estimations du nombre des espèces:

la plus basse :

100 000 espèces décrites

la plus fréquente:

1 500 000 espèces

la plus optimiste:

>10 000 000 d'espèces

Au sein d'une même espèce, il existe une grande diversité génétique...

Comment sont conservées les souches ?

- repiquage en tube

exemple:



souche sauvage originale CBS225/58 de *Nectria haematococca*
présente une instabilité naturelle



quelques années plus tard, l'instabilité a disparu: évènement mutationnel...



problème de stabilité des souches

haute mortalité

problème d'infection et de
remplacement d'une espèce par
une autre

nécessite de main d'œuvre
compétente

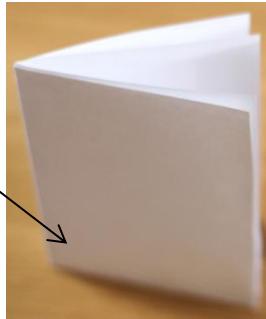
-sous huile



ne nécessite pas d'équipements complexes

-spores ou mycéliums lyophilisés

spores ou mycélium



souches plus stables

préservation plus longue

mortalité réduite

espace de stockage réduit

mais la durabilité est limitée et il faut repiquer régulièrement les souches

les dérives génétiques sont toujours possibles

les pertes sont toujours importantes

-spores ou mycéliums dans de l'eau pure



la cryopréservation dans l'azote liquide



souches stables

préservation plus longue

mortalité quasi-inexistante

mais nécessite

- des équipements complexes et onéreux
- un approvisionnement continu en azote liquide
- un grand espace pour le stockage des containers

Au laboratoire, nous utilisons la conservation à -70°C dans un milieu riche en saccharose



**équipements moins complexes
(congélateur à -80°C)**

**pannes de courant pas catastrophiques
sauf si elles durent: les tubes peuvent être
décongelés et recongelés plusieurs fois**

souches très stables

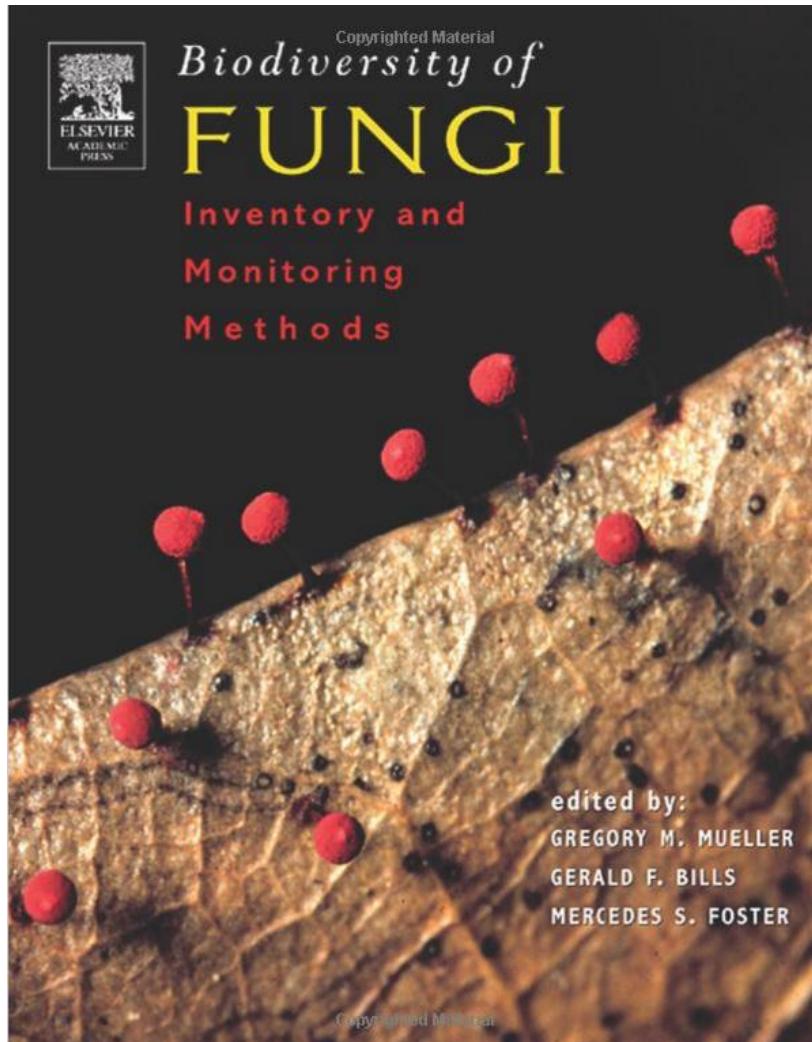
préservation longue

mortalité inexisteante

espace de stockage réduit

**fonctionne sur tout les *Eumycota* mais pas
sur les *Oomycota***

Est-il difficile de démarrer une collection?



Non!

il existe des livres qui expliquent comment isoler des champignons en donnant les meilleures recettes pour récupérer les différents types de champignons

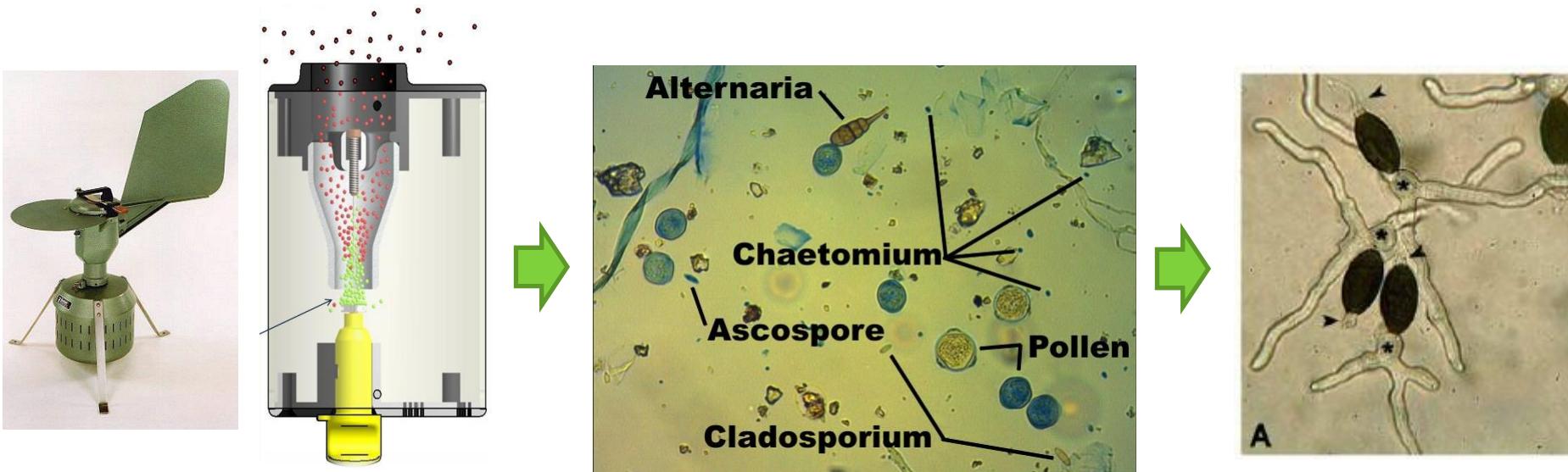
Il est possible de partir de :

- Sporophores car quasiment toutes les cellules fongiques sont totipotentes
 - Permet de savoir quel champignon est mis en culture



→ Mais les sporophores sont souvent contaminés par d'autres champignons...

- Spores récoltées dans l'environnement (dans l'atmosphère ou sur un carpophage par exemple)



→ Mais de nombreuses spores, en particulier les spores sexuelles (basidiospores et ascospores) germent difficilement...

- D'échantillons pris dans l'environnement avec mise en culture directe ou utilisation d'appâts pour privilégier certaines espèce



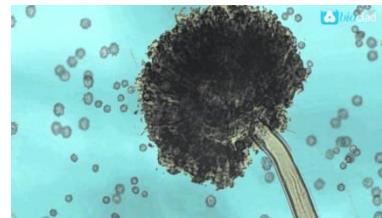
→ Problèmes des contaminations (bactéries, nématodes et acariens, champignons à croissance rapide (*Mucor*): seule une fraction des espèces est récupérée

Mais, tous les champignons ne sont pas faciles à isoler et cultiver:

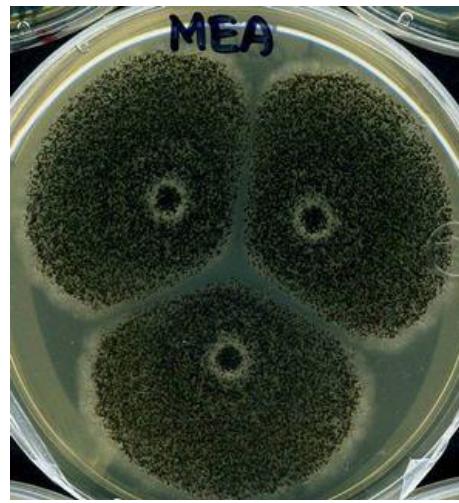
- rouilles: pathogènes obligatoires incultivables *in vitro*
 - endomycorhiziens : mutualistes obligatoires incultivables *in vitro* sauf quelques espèces à culture extrêmement difficile
 - les champignons ectomycorhiziens et les lichens ont des vitesses de croissance de quelques mm/mois
- etc.*



La détermination des espèces peut être difficile...



Aspergillus niger



Aspergillus carbonarius



Détermination
morphologique ou
moléculaire ?

La détermination morphologique ne nécessite en général pas d'équipements onéreux



Key to *Podospora* with 4-spored asci

- 1) Perithecia with swollen, articulated and agglutinated hairs (often forming a collar at the neck base), or sometimes with only swollen (non-agglutinated) hairs or single inflated and rounded peridial cells. Spores early septate, with a plasma-filled and hardly collapsing primary appendage. Filiform paraphyses absent, replaced by jacket-paraphyses.
(Schizothecium Corda emend. N. Lundq., s. Lundqvist, 1972). **2**
- 1*) Perithecia with filiform, rigid hairs, but lacking swollen, articulated hairs. Outer peridial layer of polygonal cells. Spores usually late septate, with an easily collapsing, not plasma-filled primary appendage. True paraphyses present.
4
- 2) Spores lacking a gelatinous equipment, with a decidedly inequilateral apical portion, $17-22 \times 10-13$ μm .
P. inaequalis
3
- 2*) Spores symmetrical, with a gelatinous equipment.
3
- 3) Spore head $12-14.5 \times 7-9 \mu\text{m}$.
Schizothecium (= Podospora) nanum
P. tetraspora
- 3*) Spore head $19-24 \times 12-14.5 \mu\text{m}$.
- 4) Spores $35-40 \times 18-19 \mu\text{m}$, with a well developed pedicel. Neck hairs agglutinated.
P. canserina
- 4*) Spores $50-65 \times 27-36 \mu\text{m}$, with a hardly developed or sometimes absent pedicel. Neck hairs dense but non-agglutinated.
P. australis

Mais des compétences souvent atteintes qu'après plusieurs années de pratiques...

La détermination moléculaire nécessite des équipements sophistiqués...

Au minimum:



+



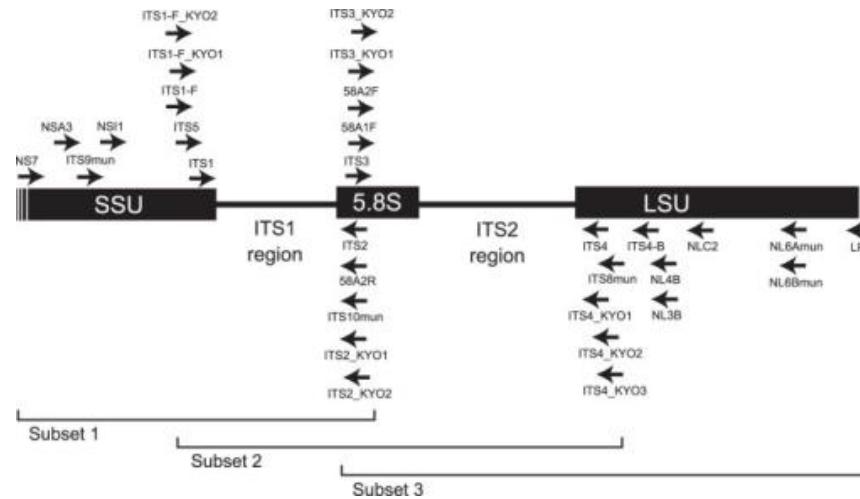
+



Le séquençage peut se faire chez un prestataire de service

Mais moins de compétences en mycologie !

détermination de la séquence code barre: région ITS chez les champignons et comparaison avec des banques



- Extraction d'ADN du champignon à identifier
- Amplification avec amores (le plus souvent ITS1 + ITS4)
- Envoi à la séquence
- Interrogation banques de données:

GenBank (<https://www.ncbi.nlm.nih.gov/genbank/>)

UNITE (<https://unite.ut.ee>)

les erreurs sont nombreuses car les espèces sont mal déterminées (y compris dans les mycothèques!)

Un exemple: souligné en rouge, des myxomycètes et non des eumycètes !!!!!!!!

Edit and Resubmit Save Search Strategies ▶ Formatting options ▶ Download

YouTube How to read this page Blast report description

Job title: Nucleotide Sequence (612 letters)

RID 37GUS5MU015 (Expires on 12-16 19:43 pm)

Query ID ldlQuery_22391

Description None

Molecule type nucleic acid

Query Length 612

Database Name nr

Description Nucleotide collection (nt)

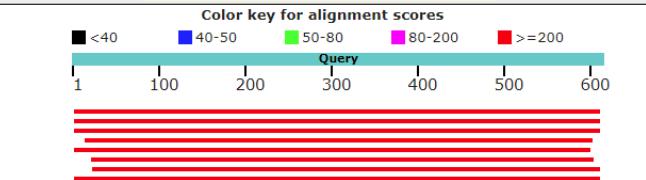
Program BLASTN 2.7.1+ ▶ Citation

Other reports: ▶ Search Summary [Taxonomy reports] [Distance tree of results] [MSA viewer]

Graphic Summary

Distribution of the top 100 Blast Hits on 100 subject sequences ⓘ

Mouse over to see the title, click to show alignments



Sequences producing significant alignments:

Select: All None Selected:0

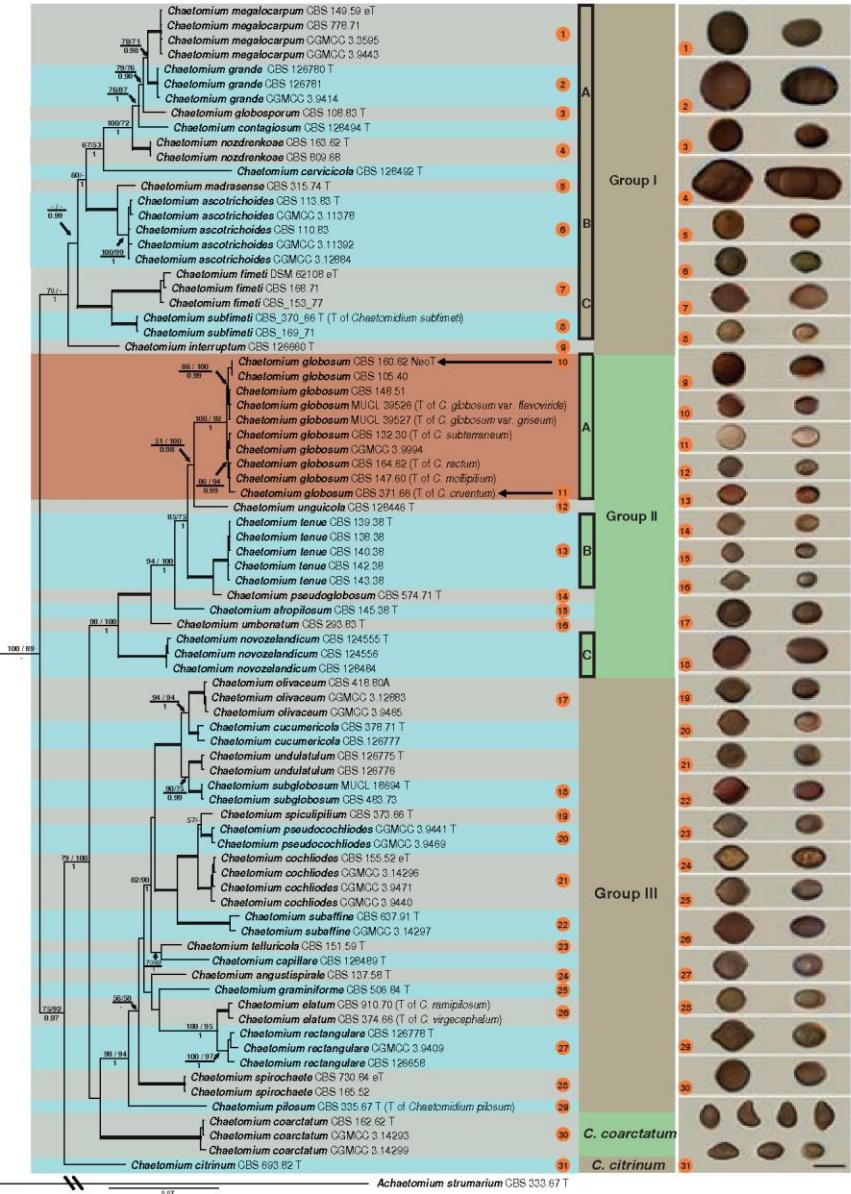
Alignments ▶ Download ▾ GenBank Graphics Distance tree of results

	Description	Max score	Total score	Query cover	E value	Ident	Accession
■	Fungal sp. d3 18S ribosomal RNA gene, partial sequence; internal transcribed spacer 1, 5.8S ribosomal RNA gene, and internal transcribed spacer 2, complete sequence; and 28S ribosomal RNA gene, partial sequence	1077	1077	98%	0.0	99%	GQ922553.1
■	Uncultured fungus clone FA1-017 18S ribosomal RNA gene, partial sequence; internal transcribed spacer 1, 5.8S ribosomal RNA gene, and internal transcribed spacer 2, complete sequence; and 28S ribosomal RNA gene, partial sequence	983	983	98%	0.0	96%	JX984744.1
■	Uncultured eukaryote clone CMH501 18S ribosomal RNA gene, partial sequence; internal transcribed spacer 1, 5.8S ribosomal RNA gene, and internal transcribed spacer 2, complete sequence; and 28S ribosomal RNA gene, partial sequence	983	983	98%	0.0	96%	KF800592.1
■	Pezizales sp. strain SA233 internal transcribed spacer 1, partial sequence; 5.8S ribosomal RNA gene and internal transcribed spacer 2, complete sequence; and large subunit ribosomal RNA gene, partial sequence	979	979	95%	0.0	97%	KX953549.1
■	Pezizales sp. P10 18S rRNA gene (partial), ITS1, 5.8S rRNA gene, ITS2 and 25S rRNA gene (partial), isolate P10	963	963	96%	0.0	96%	AJ989618.1
■	Iodophanus testaceus strain YG-C24 internal transcribed spacer 1, partial sequence; 5.8S ribosomal RNA gene and internal transcribed spacer 2, complete sequence; and 28S ribosomal RNA gene, partial sequence	924	924	94%	0.0	95%	KX683422.1
■	Physarum loratum 18S ribosomal RNA gene, partial sequence; internal transcribed spacer 1, 5.8S ribosomal RNA gene, and internal transcribed spacer 2, complete sequence; and 28S ribosomal RNA gene, partial sequence	911	911	95%	0.0	95%	HM101141.1
■	Uncultured eukaryote clone S12T_01 small subunit ribosomal RNA gene, partial sequence; internal transcribed spacer 1, 5.8S ribosomal RNA gene, and internal transcribed spacer 2, complete sequence; and large subunit ribosomal RNA gene, partial sequence	726	726	98%	0.0	89%	KX114864.1
■	Uncultured fungus 18S rRNA, ITS1, 5.8S rRNA, ITS2 and 28S rRNA, clone 1B5	726	726	98%	0.0	88%	FN689670.1
■	Ascomycota sp. UNEX FECRGA 2012E703 18S ribosomal RNA gene, partial sequence; internal transcribed spacer 1, 5.8S ribosomal RNA gene, and internal transcribed spacer 2, complete sequence; and 28S ribosomal RNA gene, partial sequence	699	699	97%	0.0	88%	KP698372.1
■	Uncultured fungus clone IIN1-21 18S ribosomal RNA gene, partial sequence; internal transcribed spacer 1, 5.8S ribosomal RNA gene, and internal transcribed spacer 2, complete sequence; and 28S ribosomal RNA gene, partial sequence	699	699	96%	0.0	89%	EU516958.1
■	Uncultured soil fungus clone C065 18S ribosomal RNA gene, partial sequence; internal transcribed spacer 1, 5.8S ribosomal RNA gene, and internal transcribed spacer 2, complete sequence; and 28S ribosomal RNA gene, partial sequence	688	688	98%	0.0	88%	JX489826.1
■	Uncultured eukaryote gene for fungal ITS1, 5.8S rRNA and ITS2, partial and complete sequence, clone ITS_C03	688	688	96%	0.0	88%	AB572266.1
■	Arcyria sp. OT2-141 internal transcribed spacer 1, partial sequence; 5.8S ribosomal RNA gene and internal transcribed spacer 2, complete sequence; and 28S ribosomal RNA gene, partial sequence	656	656	74%	0.0	93%	KT804074.1
■	Oedocephalum adhaerens 18S ribosomal RNA gene, partial sequence; internal transcribed spacer 1, 5.8S ribosomal RNA gene, and internal transcribed spacer 2, complete sequence; and 25S ribosomal RNA gene, partial sequence	656	656	98%	0.0	87%	FJ695215.1
■	Uncultured compost fungus partial 18S rRNA gene, ITS1, 5.8S rRNA gene, ITS2 partial 28S rRNA gene, clone AP38	616	616	75%	3e-172	91%	AM711392.1
■	Arcyria sp. 2332 18S ribosomal RNA gene, partial sequence; internal transcribed spacer 1 and 5.8S ribosomal RNA gene, complete sequence; and internal transcribed spacer 2, partial sequence	593	593	87%	2e-165	87%	KF574866.1
■	Fungal sp. Px2_2 4 genomic DNA containing ITS1, 5.8S rRNA gene and ITS2, isolate Px2_2_4	593	593	85%	2e-165	88%	FR648382.1
■	Arcyria nigella 18S ribosomal RNA gene, partial sequence; internal transcribed spacer 1, 5.8S ribosomal RNA gene, and internal transcribed spacer 2, complete sequence; and 28S ribosomal RNA gene, partial sequence	577	577	93%	2e-160	86%	HM101140.1
■	Oedocephalum sp. AEH3_2 18S ribosomal RNA gene, partial sequence; internal transcribed spacer 1 and 5.8S ribosomal RNA gene, complete sequence; and internal transcribed spacer 2, partial sequence	545	545	80%	4e-151	87%	KF227802.1
■	Fungal sp. Px2_3 3 genomic DNA containing ITS1, 5.8S rRNA gene and ITS2, isolate Px2_3_3	544	544	74%	2e-150	89%	FR648385.1
■	Uncultured Pezizaceae clone OTU_1282-phylogroup Pez_6 18S ribosomal RNA gene and internal transcribed spacer 2, partial sequence	538	538	54%	7e-149	96%	KX115604.1
■	Uncultured eukaryote clone CMH398 18S ribosomal RNA gene, partial sequence; internal transcribed spacer 1, 5.8S ribosomal RNA gene, and internal transcribed spacer 2, complete sequence; and 28S ribosomal RNA gene, partial sequence	508	508	71%	6e-140	88%	KF800489.1

arbres phylogénétiques

- Extraction d'ADN
- Amplification par PCR de plusieurs gènes
- Séquences
- Arbre phylogénétique en incluant des espèces connues

Plus robuste que les séquences ITS mais beaucoup moins de données dans les banques de séquences...



La solution?

FACES OF FUNGI Fungal Phyla

[Home](#) [Ascomycota](#) [Basidiomycota](#) [Basal Fungi](#) [Other fungal-like organisms](#) [!\[\]\(a2f9594c2c856a03df90ec4016df4a10_img.jpg\)](#)



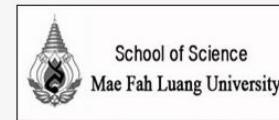
Citation for webpage

Jayasiri SC, Hyde KD, Ariyawansa HA, Bhat J, Buyck B, Cai L, Dai YC, Abd-Elsalam KA, Ertz D, Hidayat I, Jeewon R, Jones EBG, Bahkali AH, Karunaratna SC, Liu JK, Luangsa-ard JJ, Lumbsch HT, Maharachchikumbura SSN, McKenzie EHC, Moncalvo, JM, Ghobad-Nejjad M, Nilsson H, Pang KA, Pereira OL, Phillips AJL, Raspé O, Rollins AW, Romero AI, Etayo J, Selçuk F, Stephenson SL, Suetrong S, Taylor JE, Tsui CKM, Vizzini A, Abdel-Wahab MA, Wen TC, Boonmee S, Dai DQ, Daranagama DA, Dissanayake AJ, Ekanayake AH, Fryar SC, Hongsanan S, Jayawardene RS, Li WJ, Perera RH, Phookamsak R, de Silva NI, Thambugala KM, Tian Q, Wijayawardene NN, Zhao RL, Zhao Q, Kang JC, Promputtha I. 2015 – The Faces of Fungi database: fungal names linked with morphology, phylogeny and human impacts. *Fungal Diversity* 74(1):3-18 (DOI 10.1007/s13225-015-0351-8)

Curators of web page

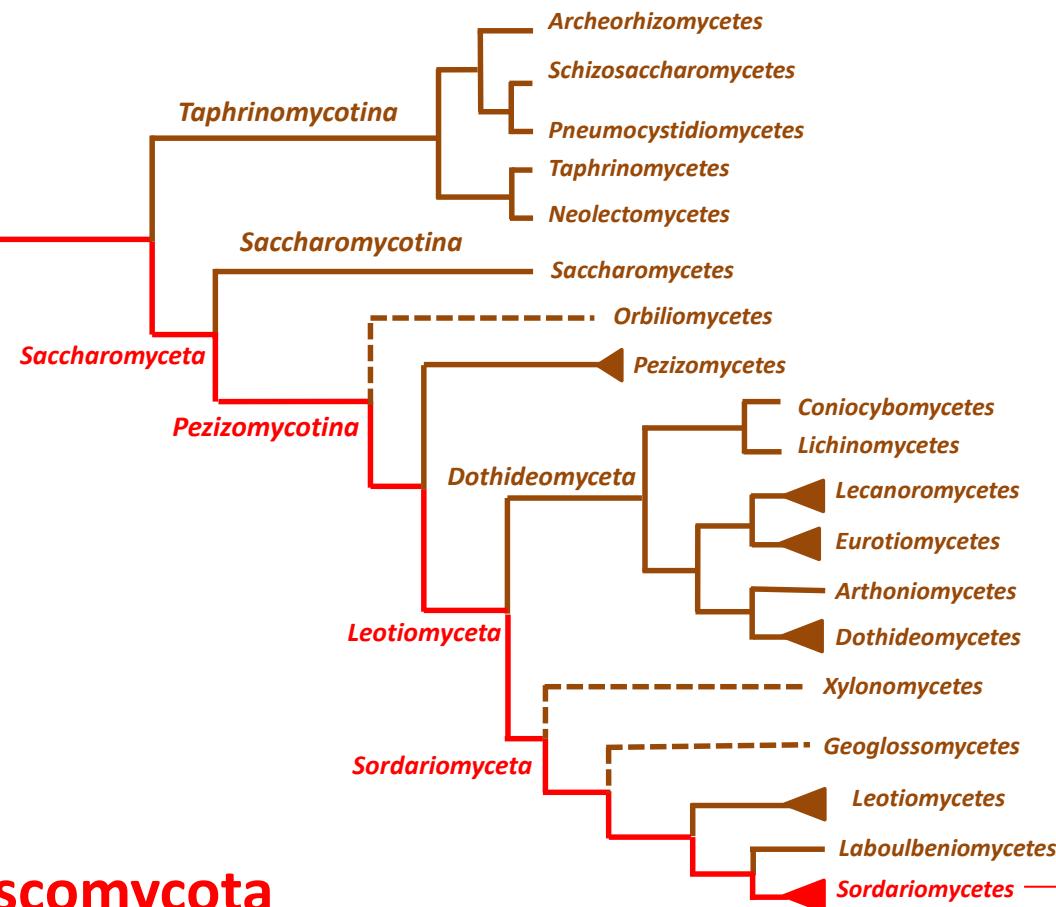
Why we need to put faces to fungi

Several fungal taxonomic databases (Index Fungorum and MycoBank) can be sourced to find taxonomic details of the fungi, while sequence data for the fungi can be sourced from GenBank and UNITE. The latter nucleotide databases in particular have very little quality control and thus blast searches for matches in GenBank are often meaningless. Although sequence data may be linked to names, the data has been lodged by literally anyone and the names are not generally linked to images, descriptions or fungarium material. There is generally no way to establish if the names are accurate or guesses. Even the AFTOL and recent higher phylogenetic studies, which have used strains from international fungaria (e.g. CBS) have rarely been linked to more than a culture number. Usually it is impossible to verify what the characters of the taxon from which the strain were isolated. Thus most fungi in public databases, whether taxonomic or gene based are faceless and much of the time we work in a vacuum, hoping that the names are correct. In April 2014 the Mushroom Research Foundation will launch a webpage for the fungi with the aim of putting faces on fungi. Not only will names have characteristics linked to sequence data, but they will also be given human attributes. Thus roles, industrial relevance, quarantine and chemistry will be included in fungal profiles. Each genus will be profiled in separate publications in relevant journals where the fungi will be illustrated, isolates from the illustrated fungi will be detailed and sequenced, and details on role, industrial relevance, biosecurity issues, importance and chemistry will be added. The relevant details will be extracted to the “faces of fungi” web site. We hope that all mycologists will contribute to this web page over time and it will provide a comprehensive one stop shop where details of fungal genera and species, molecular data as well as their roles, biosecurity issues and industrial relevance can be sourced. The present paper is written and published in order to kick start the data entry and introduce the web page to the scientific community. Thus, the aim of the web page is to show how fungi are relevant to humans and thus put a human face on the fungal world.



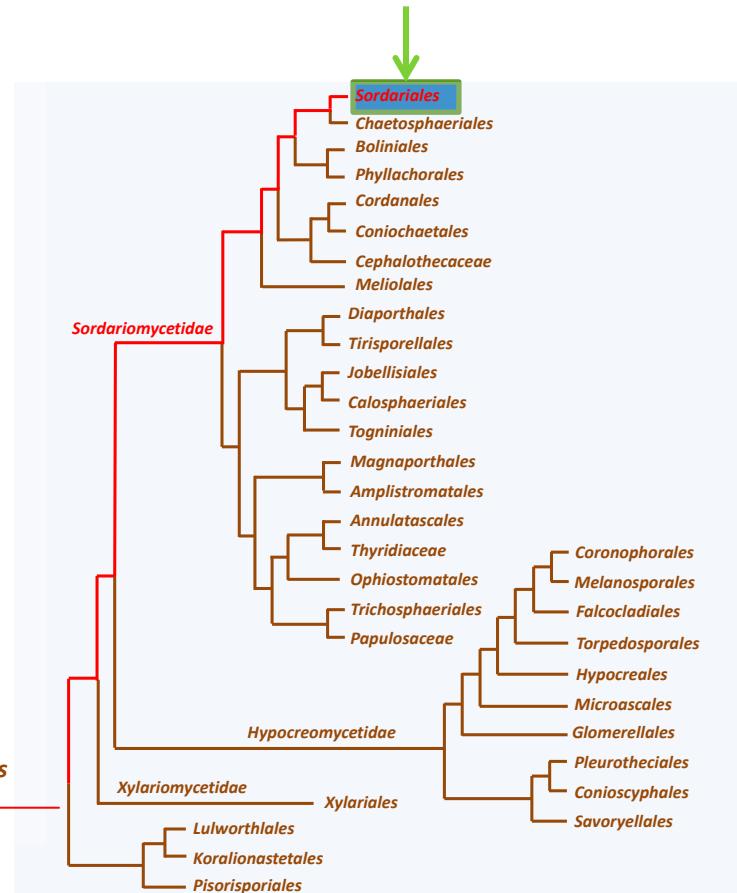
This website is under construction
Please visit again.

Un exemple de ce que je fais actuellement dans mon laboratoire - Les *Sordariales* : diversité génétique et biologique extraordinaire



Ascomycota

Ordre des *Sordariales*
Plus divers que les vertébrés!





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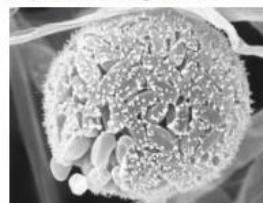
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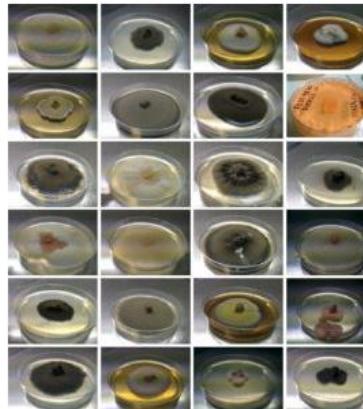
[CSP Synthesis Science Call](#)

[Evolution of a Fungal Gene Expression Regulator](#)



OCTOBER 2, 2018

wGladieux CSP19 sordariales



Morphological diversity of Sordariales growing in the lab. Pierre Gladieux's proposal explores functional diversity in *Neurospora* and its relatives. (Pierre Gladieux, INRA Montpellier)

Analyse des génomes par des collègues mais...

[FY20 Proposal Call for Community Science Program](#)

[List by Strain Name](#)[Strain Number](#)[List by CCs](#)[List by Isolation Sources](#)[Species Info](#)[Map View](#)strain name is *lasiosphaeriaceae*[Browse taxonomic tree](#)[Search](#)

- + Archaea-(861)
- + Bacteria-(70509)
- Fungi-(122628)
 - + Chytridiomycota-(89)
 - Ascomycota-(95011)
 - + Dothideomycetes-(10799)
 - + Schizosaccharomycetes-(280)
 - + Lecanoromycetes-(69)
 - Sordariomycetes-(40892)
 - + Not assigned-(2159)
 - + Trichosphaerales-(33)
 - Sordariales-(21355)
 - + Sordariaceae-(18850) ← ~ 18 000 Souches déletions systématiques + mutants
 - + Not assigned-(221)
 - + Lasiosphaeriaceae-(365)
 - + Helminthosphaeriaceae-(32)
 - + Chaetomiaceae-(1828)
 - + Cephalothecaceae-(59)
 - + Ophiostomatales-(923)
 - + Xylariales-(1874)

Peu de souches dans les collections pour la plupart des familles

Les souches coutent cher!

https://www.lgcstandards-atcc.org

https://www.lgcstandards-atcc.org/search#q=podospora&sort=relevancy

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Relevance A-Z Z-A

Content Type

- Documents (67)
- Products (67)

Document Type

- Product Sheet (67)

Product Category

- Fungi & Yeast (134)

Biosafety Level

- 1 (134)

List of Applications

Podospora anserina (Cesati) Niessl, teleomorph (ATCC® 12487b.)

Strain Designations: CBS 292.56
Deposited As: Podospora anserina (Cesati) Niessl, teleomorph
Type Strain: No
BSL: 1
Product Format: frozen

Add to Cart (€431.00)

Podospora anserina (Cesati) Niessl, teleomorph (ATCC® 12487b Product Sheet)

Podospora petrogale Bell, teleomorph (ATCC® MYA-1392)

Strain Designations: A193 [CBS 109409, WELTU Fungus Collection 684]
Deposited As: Podospora petrogale Bell, teleomorph
Type Strain: Yes
BSL: 1
Product Format: frozen

Contact Sales

→ Isolement de nouvelles souches et mise en collection!

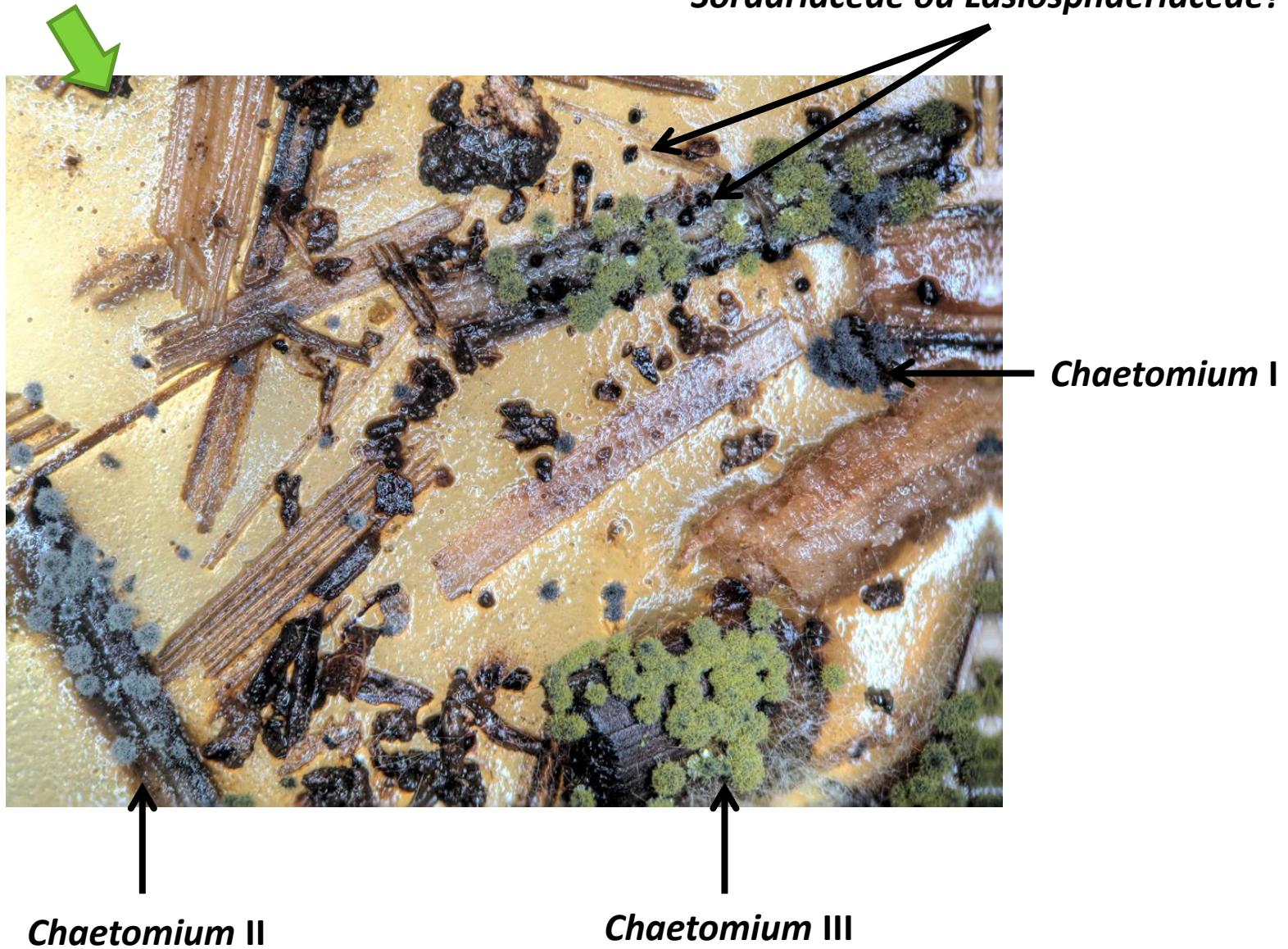
Comment fait-on?

Chambres humides avec excréments d'herbivores pour les coprophiles ou des morceaux de bois pour les lignicoles

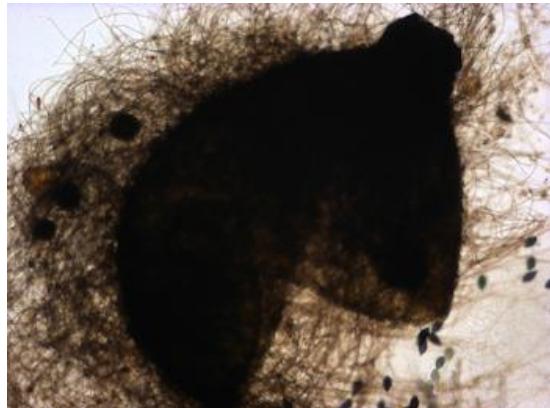


Inoculation sur milieu avec sources de carbone complexes pour les espèces du sol, de la litière et les endophytes

Mise en culture sur M0+miscanthus



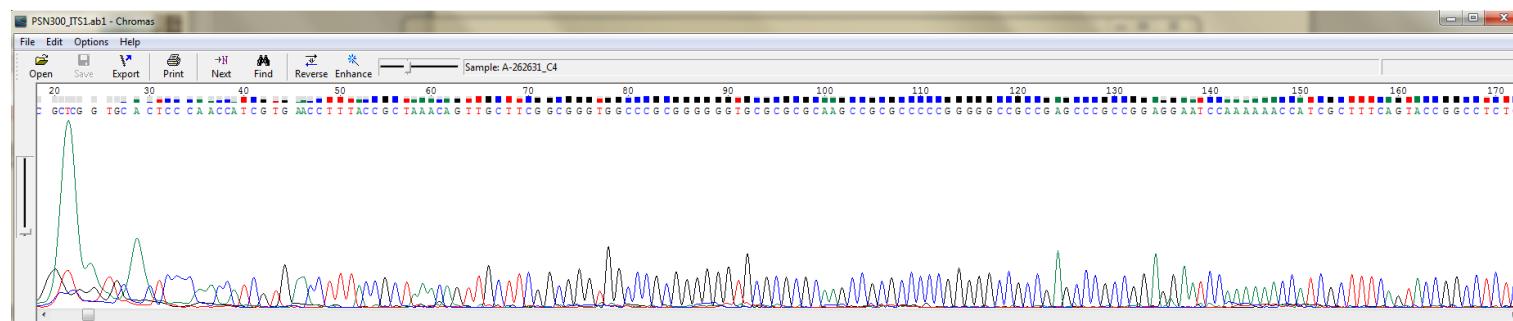
Identification rapide par la morphologie



Lasiosphaeriaceae: mise en culture



Séquence du code barre (ITS)



Analyse de GenBank par BLAST

Une fois validée: chaque souche est mise en collection!

BO	BP	BQ	BR	BS	BT	BU	BV	BW
BOITE AE15								
souche	espèces			date de mise en RG				
T11(P.roq V3(pAN7.1::hygro ^R)	<i>P. roqueforti</i>							
T4(P.roq V3(pAN7.1::hygro ^R)	<i>P. roqueforti</i>							
T11(P.roq V3(pAN7.1-Ago::hygro ^R)	<i>P. roqueforti</i>							
T14(P.roq V10(pAN7.1::hygro ^R)	<i>P. roqueforti</i>							
T15(P.roq V10(pAN7.1-Ago::hygro ^R)	<i>P. roqueforti</i>							
T17(P.roq V10(pAN7.1-Ago::hygro ^R)	<i>P. roqueforti</i>		juin-17					
CBS307.81sp4 mattl-2 (=MT-)	<i>Cercophora samala</i>							
CBS307.81sp5 mattl-1 (=MT-)	<i>Cercophora samala</i>		juil-17					
CBS 390.84	<i>Apicoscordaria longicaudata</i>							
CBS 315.58	<i>Apicoscordaria verruculosa</i>		aout 2017					
PSN237	<i>Doratomecespuriopurpureofuscens</i>							
PSN238	<i>Doratomeces sp.</i>							
PSN239	<i>Podospora anserina</i>							
PSN240A								
PSN240B								
PSN240C	<i>Podospora anserina</i>							
PSN240D								
PSN241	<i>Podospora anserina</i>							
PSN242	<i>Podospora aff. Communis</i>							
PSN243	<i>Podospora aff. Communis</i>							
PSN244	<i>Schizothecium sp.</i>							
PSN245	<i>Schizothecium sp.</i>							
PSN246	<i>Schizothecium sp.</i>							
PSN247	<i>Sordaria macrospora</i>							
PSN248	<i>Fusarium equiseti</i>							
PSN249	<i>Sordaria aff. Macrospora</i>							
PSN250	<i>Pezizales sp.</i>							
PSN251	<i>Chaetomium sp.</i>							
PSN252	<i>Chaetomium sp.</i>							
PSN253	<i>Coprinellus bisporus</i>							
PSN254	?????							
PSN255	<i>Sordaria aff. Fimicola</i>							
PSN256	<i>Gelaniscospora brevispora</i>							
PSN257	<i>Gelaniscospora cratophora</i>							
PSN258	<i>Podospora aff. curvuloides</i>							
PSN259	<i>Cladorthinum sp.</i>							
PSN260	<i>Gelaniscospora seminuda</i>							
PSN261	<i>Peletotrichosphaerella cucumerina</i>							



En attente d'identification