

University of California Davis

PHAFF COLLECTION NEWS

December 2013

Phaff Yeast
Culture Collection
Yeasts of yesterday and today,
For discoveries of tomorrow

Kyria Boundy-Mills, Curator since 2001



2013 at the Phaff Yeast Culture Collection

Following a tradition set over 100 years ago, we continue to preserve and distribute wild-type yeasts, use them in cutting-edge research, and provide training for scientists of tomorrow.

The Phaff Yeast Culture Collection, housed in the Department of Food Science and Technology at the University of California Davis, is the fourth largest collection of wild yeasts in the world. The yeasts are used in-house for a variety of research projects (see page 4). They are also used by academic, government agency and industrial researchers around the world for pure and applied research areas ranging from taxonomy and ecology to development of improved biofuels and therapeutics. We honor the memory of Herman Phaff (page 3), whose many decades of efforts allow us to perform research using dozens or hundreds of yeast strains (page 4).

Page 2
Ten years of
holiday greetings



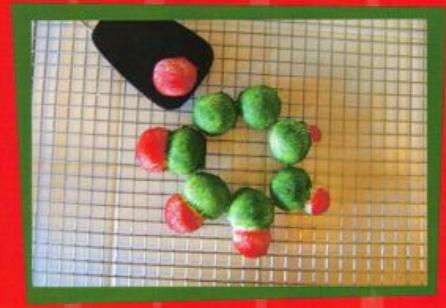
Page 3
Commemoration of
Herman Phaff's 100th
birthday



Page 4
Research using Phaff
collection yeasts: Oil-
accumulating species



Pages 5-6
Additions,
updates,
personnel



May the "budding" new year bring growth and prosperity to you and your collection!

Best wishes from the
Phaff Yeast Culture Collection,
Food Science and Technology,
University of California Davis

Kyria Boundy-Mills, Curator

Your feedback is very valuable!

We love hearing from researchers who use the Phaff collection, or would like to collaborate on future research projects. Send your comments to kblmills@ucdavis.edu.

How do you use the Phaff collection?

What strains have you found in the Phaff collection that you couldn't find elsewhere?

What publications have come out of your work with Phaff collection yeasts?

How can we serve you better?

What strains or services would you like to see?

What improvements should we make to the Phaff collection website?

How are our prices compared to those of other collections?

2013 marks the tenth year of Phaff collection photo greetings!

How many of these cheerful greetings do you have posted in your office?



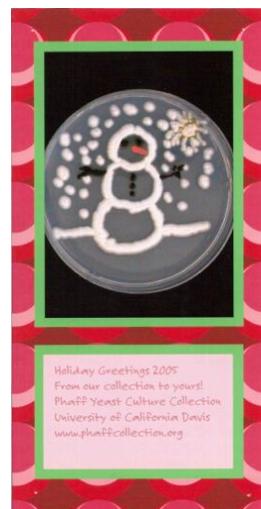
It was fall 2004. Phaff collection curator Kyria Boundy-Mills wanted to reach out to selected friends and colleagues to share the joy of working with yeasts in a whimsical way. During a survey of yeasts associated with olives, she noted that one of them exhibited a unique phenotype on agar plates: hyphal growth that gradually turned dark green as the plate aged. In other words, it looked like pine tree branches. After a few simple streaks on an agar plate, accented with some pink yeasts (*Phaffia rhodozyma* of course) and an anonymous white yeast, the first Phaff collection greeting photo was completed. It was the first in a series

of Phaff collection greeting cards.

The feedback was very positive, so Dr. Boundy-Mills continued with annual creations. Subsequent years saw snowmen, snowflakes, and other seasonal themes, followed by creations related to research in the lab: yeast lipids symbolizing the work on oleaginous (lipid-accumulating) yeasts, and yeast flies and other insects.



We hope you enjoy these creations! Let us know if you would like to be added to our mailing list.



We enjoy receiving cards from other collections too! You can send your collection's greeting cards to:

Kyria Boundy-Mills
Curator, Phaff Yeast Culture Collection
Food Science, UC Davis
One Shields Ave
Davis, CA 95616 USA

Herman Phaff in the old culture room, Cruess Hall, 1996

Phaff collecting *Phaffia* yeast, Japan, 1967

Herman Phaff's 100th Birthday Commemoration

Thursday May 30, 2013 marked the 100th anniversary of Herman Phaff's birth. Phaff was a professor in the Food Science and Technology department from 1943 until his "retirement" in 1983. He continued to come to work every day until the age of 88, shortly before he passed away in August 2001. In the course of his long career studying the ecology, physiology and taxonomy of yeasts, he expanded and developed the Phaff Yeast Culture Collection (phaffcollection.ucdavis.edu), the fourth largest public collection of wild yeasts in the world. The collection, his living legacy, spans over 100 years of yeast research at the University of California, with over 7,000 strains belonging to over 800 species in the public catalog. Current curator Kyria Boundy-Mills had the honor of working with Phaff for two years, and took over the management of the collection when Phaff passed away in 2001. Boundy-Mills has greatly expanded the collection by continuing research in the same fields studied by Phaff, incorporating new technologies such as next-generation DNA sequencing. Yeasts carefully selected, characterized and preserved by Phaff, his close colleague Marty Miller, and other

UC personnel continue to be used by researchers all around the world for research on biofuels, taxonomy, therapeutics, food and beverage fermentations, and much more. His contributions to the field of yeast taxonomy have honored in the purest form known to yeast taxonomists: his colleagues named several yeast genera and species after him including *Phaffia* and *Phaffomyces*.

Phaff was also very active in campus and community, especially in music. He was a cellist and founding member of the UC Davis Symphony Orchestra, was named an honorary member of the UC Davis Music Department, and was on the committee that helped design Freeborn Hall.

Phaff is remembered with fondness and admiration by his widow Diane Phaff-DeCamp, by the current curator of the Phaff collection Kyria Boundy-Mills, and by many colleagues, students, friends and family around the world.

Bioresouce Technology

Contents lists available at SciVerse ScienceDirect
journal homepage: www.elsevier.com/locate/biotech

Manipulation of culture conditions alters lipid content and fatty acid profiles of a wide variety of known and new oleaginous yeast species

Irnayuli R. Sitepu^{a,b,*}, Ryan Sestric^c, Laura Ignatia^a, David Levin^c, J. Bruce German^a, Laura A. Gillies^d, Luis A.G. Almada^a, Kyria L. Boundy-Mills^a

CrossMark

Journal of Microbiological Methods

Contents lists available at SciVerse ScienceDirect
journal homepage: www.elsevier.com/locate/jmicmeth

An improved high-throughput Nile red fluorescence assay for estimating intracellular lipids in a variety of yeast species

L.R. Sitepu^{a,b,*}, L. Ignatia^a, A.K. Franz^c, D.M. Wong^c, S.A. Paulina^b, M. Tsui^d, A. Kanti^e, K. Boundy-Mills^a

Two recent publications on oleaginous (lipid-accumulating) yeasts are expanding the field to include many new high oil yeasts, some of which can accumulate over 60% oil by dry weight. Most of these strains are available for distribution to interested researchers.

- *Kurtzmaniella cleridarum* UCDFST 76-729.2
- *Myxozyma melibiosi* UCDFST 52-87
- *Rhodosporidium paludigenum* UCDFST 09-163
- *Rhodotorula colostri* UCDFST 67-113
- *Rhodosporidium babjevae* UCDFST 05-775, 04-877, 68-916.1
- *Rhodosporidium diobovatum* UCDFST 04-830, UCDFST 08-225 and UCDFST 67-405
- *Rhodosporidium fluviale* UCDFST 81-485.4
- *Cryptococcus terreus* UCDFST 61-443
- *Cryptococcus wieringae* UCDFST 05-554
- *Cryptococcus oierensis* UCDFST 05-864
- *Hannaella* aff. *zeae* UCDFST 92-112
- *Tremella encephala* UCDFST 68-887.2
- *Cryptococcus victoriae* UCDFST 10-939
- *Cryptococcus* aff. *taibaiensis* UCDFST 73-750,
- *Trichosporon guehoae* UCDFST 60-59,
- *Cryptococcus ramirezgomezianus* UCDFST 54-11.224,
- *Prototheca* aff. *zopfii* UCDFST 10-495

Before we started this work, there were about 40 known oleaginous (lipid-accumulating) yeast species. In 2012, we published an improved method for evaluating yeast lipids using Nile red fluorescence, which included announcement of 5 new oleaginous species. In 2013, we published a survey announcing 12 more oleaginous species. **These studies were made possible by utilization of the vast and diverse Phaff Yeast Culture Collection.**

New oleaginous species we have discovered in 2012 and 2013 include sixteen yeasts and one achlorophyllous alga that resembles yeasts morphologically.

Watch for more publications in this field in 2014:

- Sugar assimilation and toxin tolerance of over 40 oleaginous yeast species
- A review of oleaginous yeasts as a source of biodiesel
- Growth of selected yeasts on lignocellulosic hydrolysates
- Improved methods for harvesting yeast oil

Updates and Additions at the Phaff Yeast Culture Collection

New yeasts added to the Phaff Yeast Culture Collection in 2013:

Novel yeast species most closely related to

- *Candida endomychidarum*
- *Candida friedrichi*
- *Candida olivae*
- *Candida subhashii*
- *Candida tenuis*
- *Candida trypodendroni*
- *Geotrichum klebahnii*

Additional species added to the collection this year:

- *Blastobotrys elegans*
- *Candida cantarelli*
- *Candida glucosophila*
- *Candida phangngensis*
- *Candida riocensis*
- *Candida transvaalensis*
- *Candida vaccinii*
- *Cryptococcus rajasthanensis*
- *Metschnikowia koreensis*
- *Myxozyma lipomycooides*
- *Saturnispora mendoncae*
- *Trichosporon siamense*

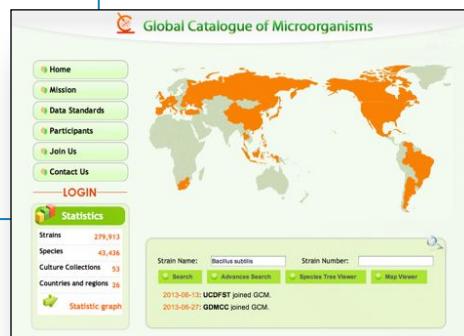
PODCAST: In September, Radio New Zealand broadcast a 13-minute interview with Phaff collection curator Kyria Boundy-Mills. Learn more about the history of the collection and current activities by listening to the "This Way Up" podcast:

<http://www.radionz.co.nz/national/programmes/thiswayup/audio/2570012/yeast-museum>



NATIONAL AND INTERNATIONAL INVOLVEMENT:

Phaff collection curator Kyria Boundy-Mills is active in microbial culture collection organizations. She has served on the Steering Committee of the US Culture Collection Network since 2012. In fall 2013, was appointed to the Executive Board of the World Federation for Culture Collections. In these positions, she is advocating for continued and increased support for culture collections. Your suggestions to improve support of culture collections are welcome.



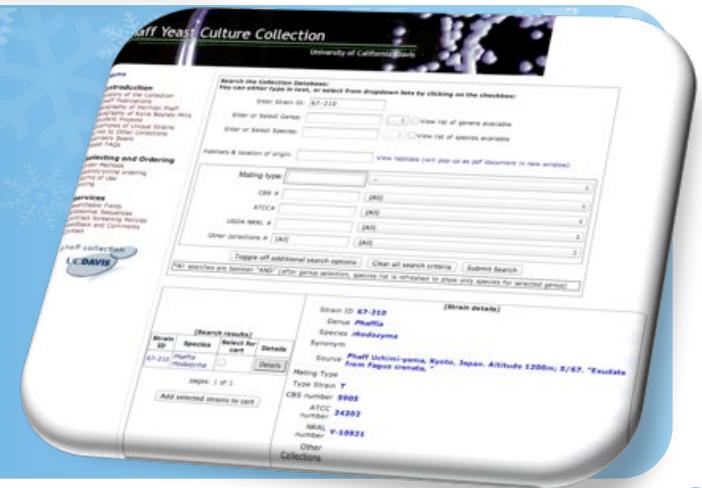
GLOBAL CATALOG OF MICROORGANISMS: In 2013, the Phaff collection strain catalog was added to the GCM, an effort by the World Data Centre for Microorganisms (WDCM) under the WFCC to provide access to dozens of culture collection catalogs simultaneously. Visit <http://gcm.wfcc.info>.

New URL!

Update your bookmark in your web browser!

New URL for the Phaff collection, including the strain catalog:

<http://phaffcollection.ucdavis.edu>





Phaff Collection personnel

The Phaff Yeast Culture Collection and the Boundy-Mills lab research program thrive due to the diligent work of students and professional staff.

Curator **Kyria Boundy-Mills** has worked with the collection since 1999, first as assistant curator under Herman Phaff, then as curator since 2001.

Post doc **Irnayuli Sitepu** has worked in the Boundy-Mills lab since 2010. Her work over the last year has focused primarily on characterization of lipids from oleaginous yeast, and scaling up production. She helps to maintain and operate the Phaff collection.

Graduate student **Tonio Garay** is scaling up production of oil from oleaginous yeasts, and is developing improved methods to harvest oil.

Undergraduate students **Tylan Selby, Grace Ghrist, Enrique Fernandez, Erin Cathcart, Shirley Zhu, Ting Lin, Joe Williams, Silviana Tjahyono** and **Elaine Chow** aided in culture collection maintenance, analysis of lipids, and characterization of yeast physiological properties. Many former students have gone on to graduate or professional school, or jobs in the food and biotechnology

Left to right: Tylan Selby, Grace Ghrist, Tonio Garay, Enrique Fernandez, Erin Cathcart, Irnayuli Sitepu, Shirley Zhu, Kyria Boundy-Mills, Elaine Chow (May 2013)

