



# Supplement Symposium



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# NBJ Summit 2023 Lifetime Achievement Award Honoree

*Early Announcement for our 2024  
NBJ Summit Live Event*



# About the NBJ Lifetime Achievement Award

*NBJ Summit's annual Lifetime Achievement Awards recognize accomplished executives who go above and beyond the call of duty on behalf of the nutrition industry.*

# 2023 NBJ Summit Lifetime Achievement Award Honoree



## Paul Stamets

Owner, Founder & Director of Research  
*Host Defense Mushrooms | Fungi Perfecti, LLC*

**Revolution from the Underground:**

**Awakening to the Power of**

**Mycelium and Mushrooms**

**September 23, 2023**

**Paul Stamets**



# MY DISCLOSURES

Founder/Owner

FUNGI PERFECTI, LLC /HOST DEFENSE MUSHROOMS  
([www.fungi.com](http://www.fungi.com))



Co-Founder

MYCOMEDICA LIFE SCIENCES, PBC  
([www.mycomedica.com](http://www.mycomedica.com))

Co-Director

CENTER FOR ECOLOGICAL CONSCIOUSNESS (CEC)  
501(3)(C) NON-PROFIT  
([www.ecologicalconsciousness.org](http://www.ecologicalconsciousness.org))

Author

7/8 books describing psilocybin mushroom identification and cultivation

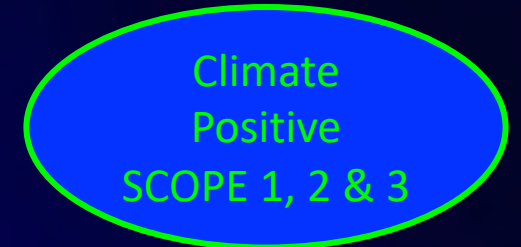
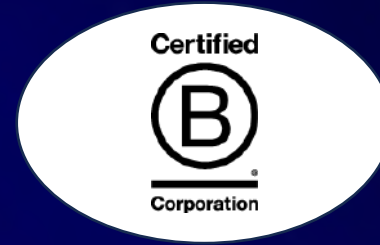
DEA License (U.S.)

Psilocybin Controlled Substances Registration RF0644852

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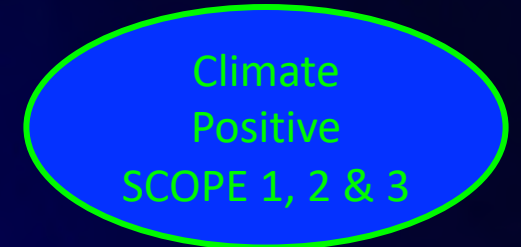
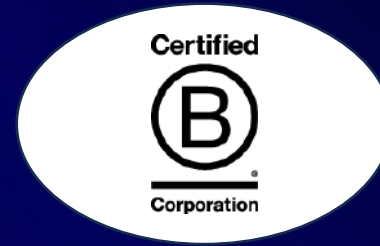
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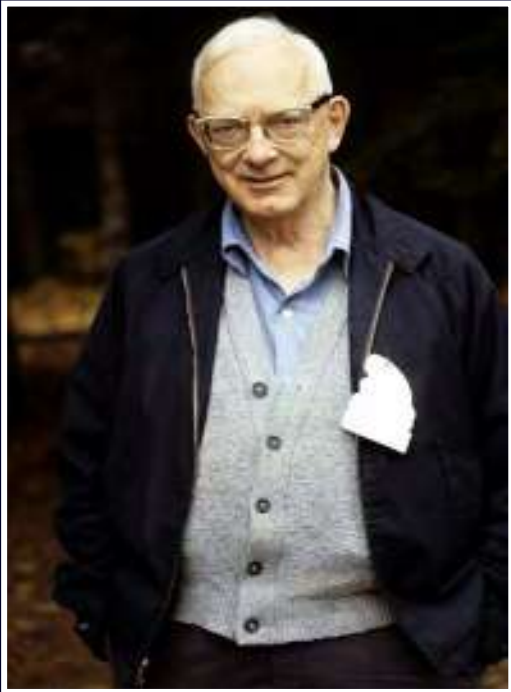


- **Scope 1** is called DIRECT, and it refers to direct emissions resulting from manufacturing at company-owned facilities.
- **Scope 2** refers to INDIRECT emissions, in the form of energy purchased from a third-party. For us, this means the energy that we source for heating, cooling, and electricity at our facilities.
- **Scope 3**, the most complex and biggest scope, which focuses on emissions both UPSTREAM & DOWNSTREAM

*By purchasing a Host Defense product, you're helping to offset over 10% more carbon emissions than were released to produce it.*



# My Mentors



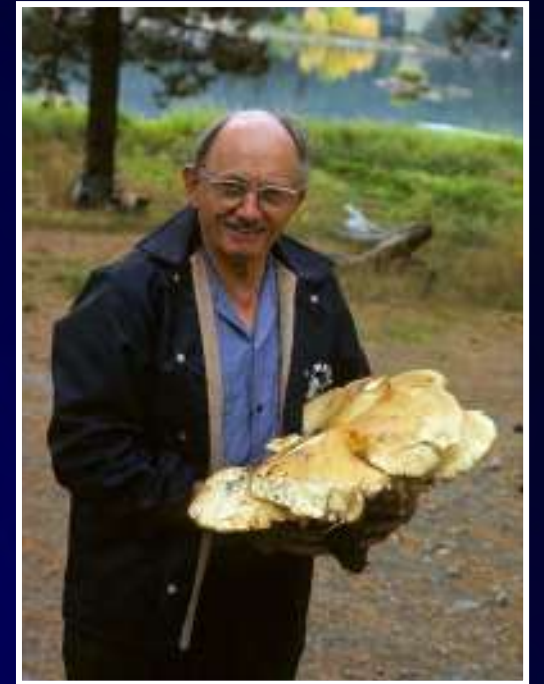
Dr. Daniel Stuntz



Catherine "Kit" Scates



Dr. Michael Beug



Dr. Alexander Smith



William K. Stamets '37 6/23/1993

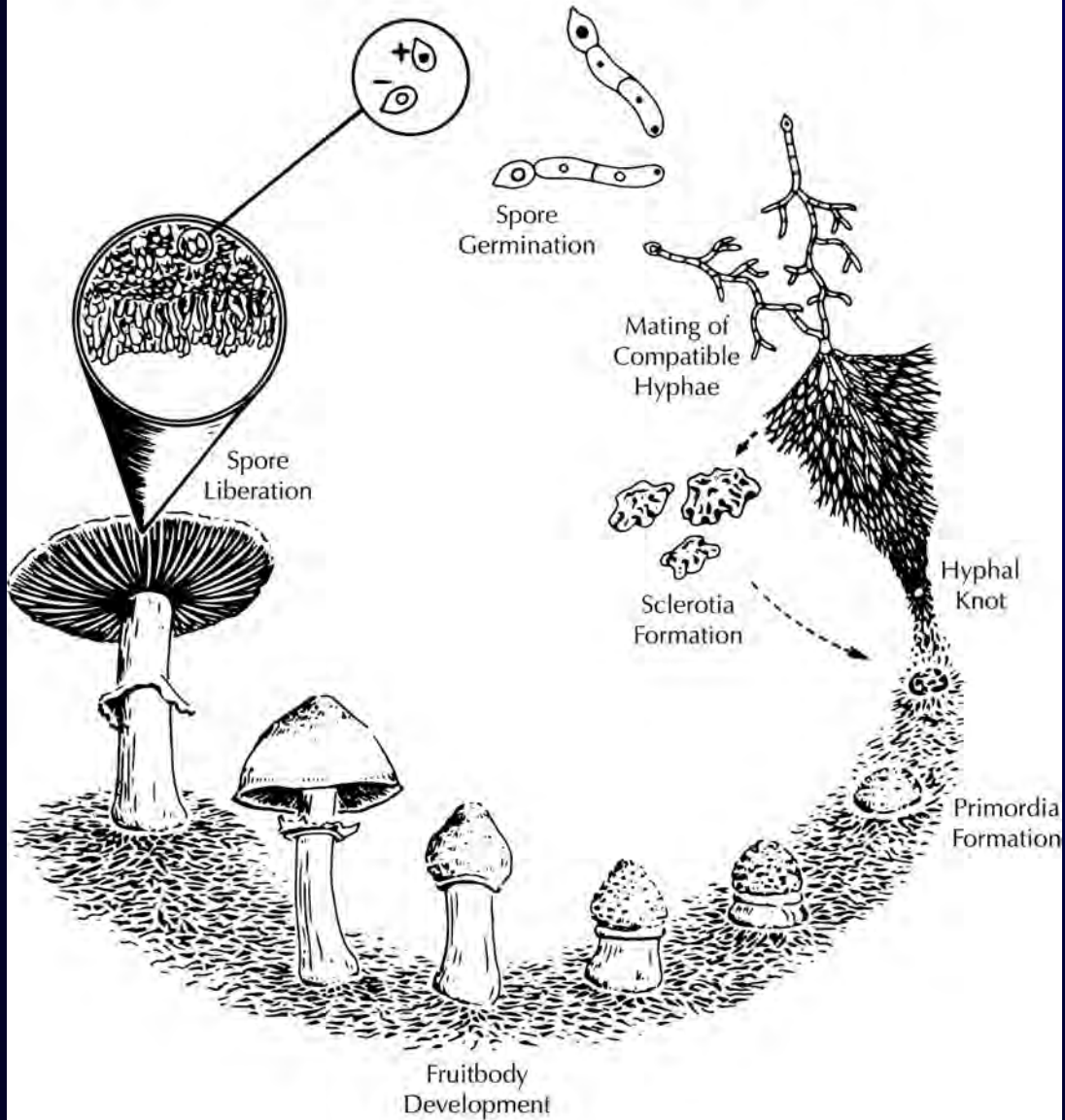
Patricia N. Stamets 3/1/2019

John W. Stamets 6/7/2014





# THE MUSHROOM LIFE CYCLE



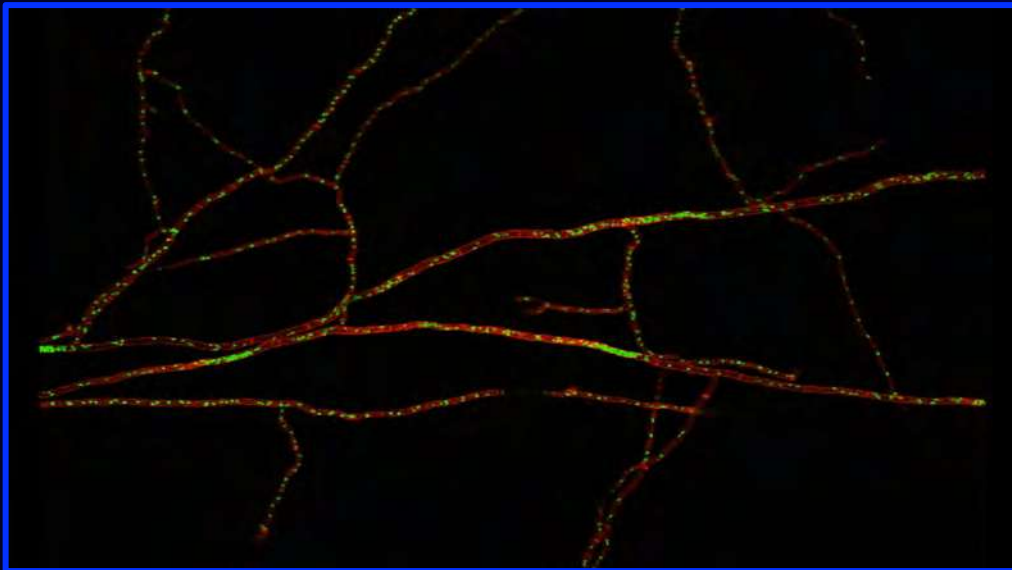
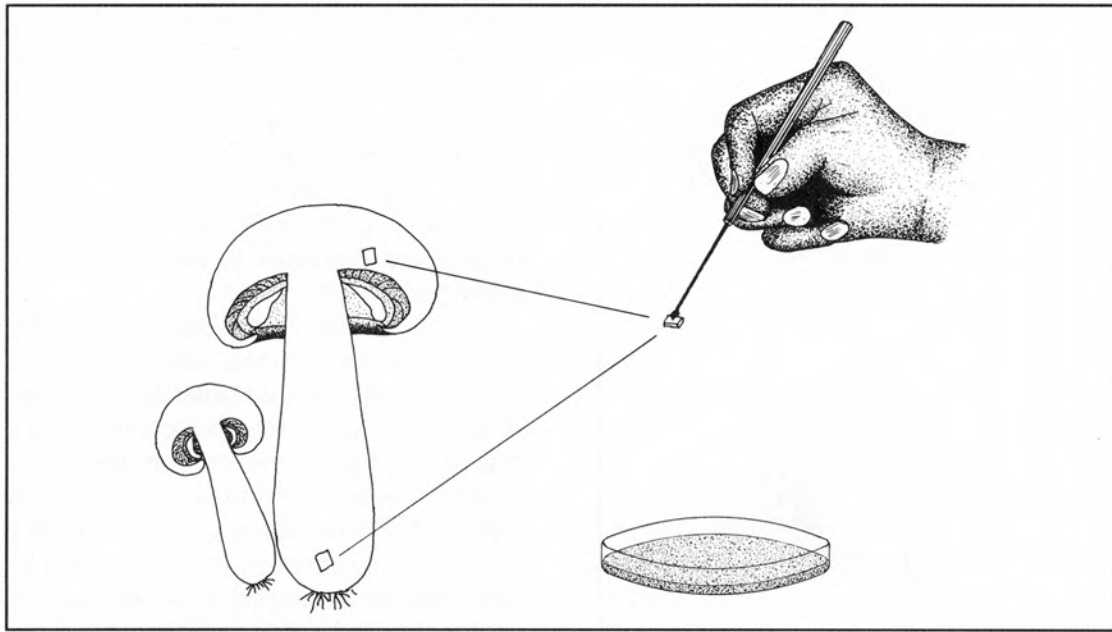
© 1995 Paul Stamets, all rights reserved. Do not duplicate without permission.

The parts of a mushroom should be scientifically specific:

Mushroom spores  
Mushroom mycelium  
Mushroom fruitbody

Similarly with plants:

Plant seeds/spores  
Plant leaves  
Plant stems  
Plant roots



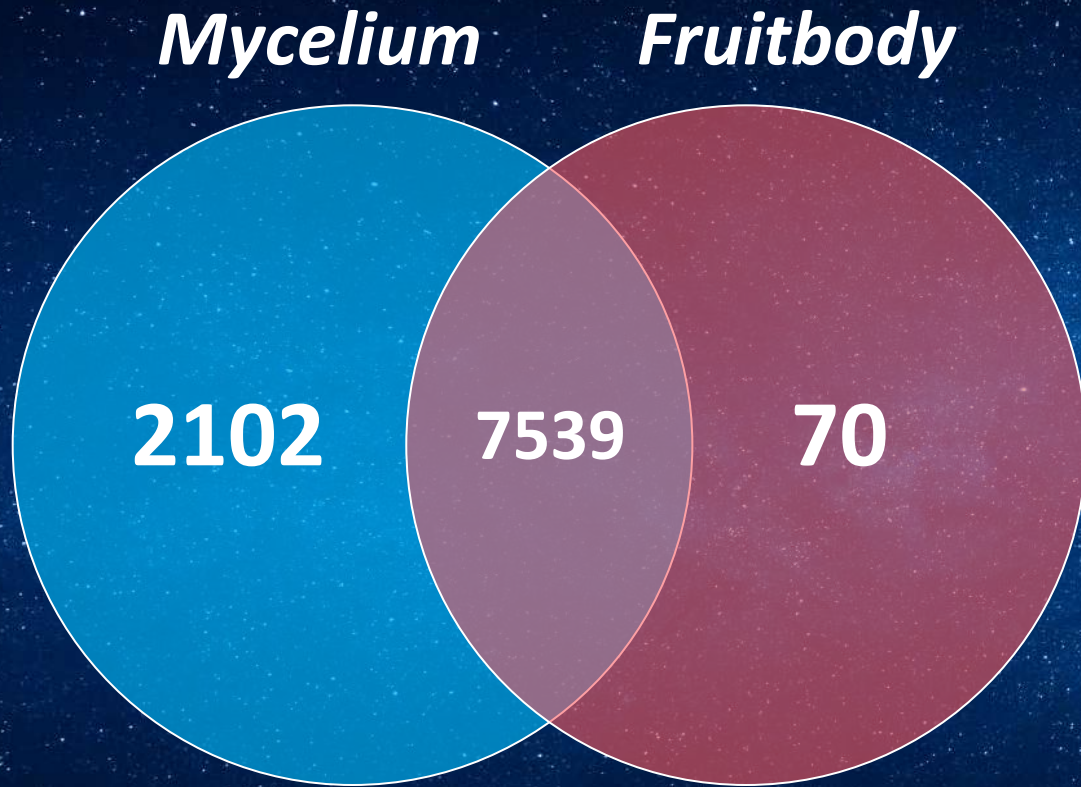
The mushroom life cycle is a continuum, expressing many constituents throughout.



*Psilocybe cubensis*

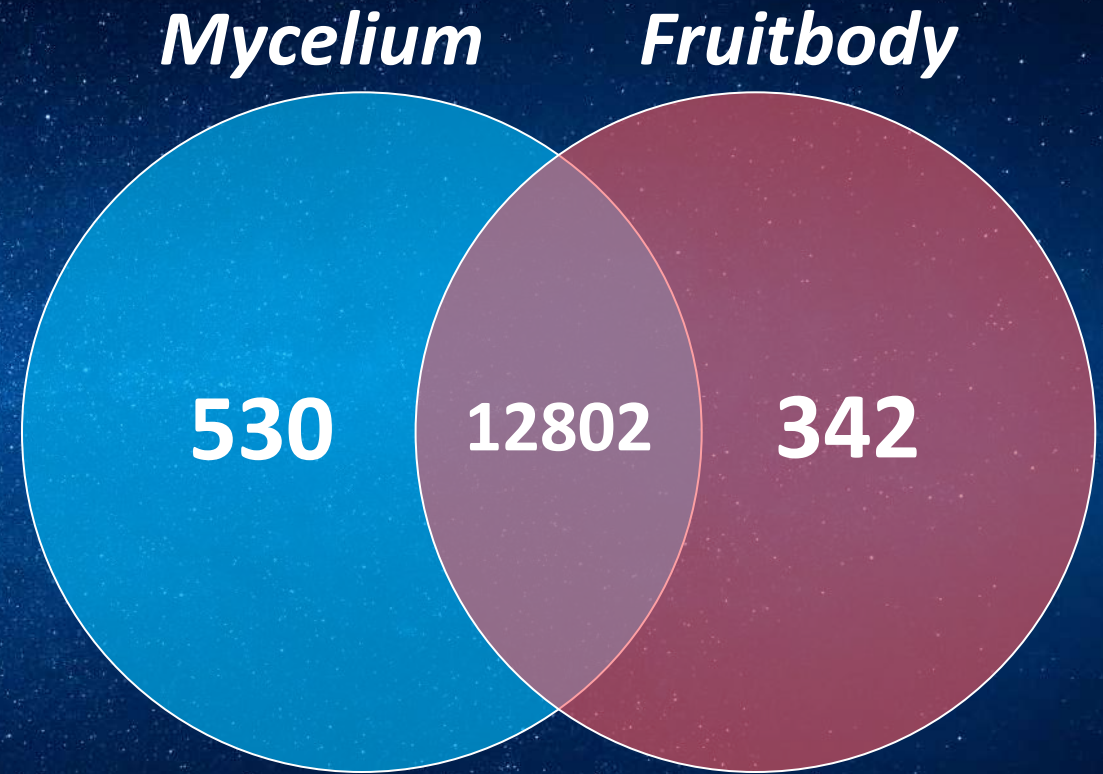


# Lion's Mane



Modified from Chen et al. (2017)  
DOI: 10.1038/s41598-017-10376-0

# Reishi



Modified from Chen et al. (2012)  
DOI: 10.1038/ncomms1923

More genes are expressed in **mycelium** than are expressed during the **fruitbody** phase.



Frontiers in Aging Neuroscience | Sections | Articles | Research Topics | Editorial Board | About Journal

CLINICAL TRIAL article  
 Front. Aging Neurosci., 03 June 2020  
 Sec. Alzheimer's Disease and Related Dementias  
<https://doi.org/10.3389/fnagi.2020.00155>

This article is part of the Research Topic  
 Translational Advances in Alzheimer's, Parkinson's, and other Neurodegenerative Dementias  
[View 31/70 Articles](#)

## Prevention of Early Alzheimer's Disease by Erinacine A-Enriched *Hericium erinaceus* Mycelia Pilot Double-Blind Placebo-Controlled Study

I-Chen Li<sup>1</sup>, Han-Hsin Chang<sup>2</sup>, Chuan-Han Lin<sup>3</sup>, Wan-Ping Chen<sup>1</sup>, Tsung-Han Lu<sup>2</sup>, Li-Ya Lee<sup>1</sup>, Yu-Wen Chen<sup>1</sup>, Yen-Po Chen<sup>1</sup>, Chin-Chu Chen<sup>1,4,5,6\*</sup> and David Pei-Cheng Lin<sup>3,7\*</sup>

PHYTOTHERAPY RESEARCH  
*Phytother. Res.* **23**, 367–372 (2009)  
 Published online 10 October 2008 in Wiley InterScience  
 (www.interscience.wiley.com) DOI: 10.1002/ptr.2634

## Improving Effects of the Mushroom Yamabushitake (*Hericium erinaceus*) on Mild Cognitive Impairment: A Double-blind Placebo-controlled Clinical Trial

Koichiro Mori<sup>1\*</sup>, Satoshi Inatomi<sup>1</sup>, Kenzi Ouchi<sup>1</sup>, Yoshihito Azumi<sup>1</sup> and Takashi Tsuchida<sup>2</sup>

<sup>1</sup>Mushroom Laboratory, Hokuto Corporation, 800-8, Shimokomazawa, Nagano, 381-0008, Japan  
<sup>2</sup>Isogo Central and Neurosurgical Hospital, 1-16-26, Mori, Isogoku, Yokohama, 235-0023, Japan



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RESEARCH ARTICLE | Volume 6 - Issue 1

## *Hericium erinaceus* Mycelium Exerts Neuroprotective Effect in Parkinson's Disease-*in vitro* and *in vivo* Models

Pao-Pao Yang<sup>1,2</sup>, Chih-Yung Lin<sup>2</sup>, Tzu-Yin Lin<sup>2</sup>, and Win-Chin Chiang<sup>2\*</sup>

<sup>1</sup>Institute of Biotechnology and Pharmaceutical Research, National Health Research Institutes, Miaoli County, Taiwan, Republic of China  
<sup>2</sup>JOWIN BIOPHARMA Inc, Taiwan, Republic of China

\*Corresponding author: Win-Chin Chiang, JOWIN BIOPHARMA Inc, Xizhi, New Taipei City, Taiwan, 9F-12, No. 97, Sec. 1, Xintai 5<sup>th</sup> Road, Xizhi Dist, New Taipei City, Taiwan (22175), E-mail: winchiang@jowinbio.com

Received: 20 Feb, 2020 | Accepted: 13 Mar, 2020 | Published: 20 Mar, 2020

The mycelium of Lions Mane contains erinacines; the fruitbodies do not!

Erinacines stimulate NGF (Nerve Growth Factors)



> *Acta Biomater.* 2022 Jun;145:272-282. doi: 10.1016/j.actbio.2022.04.011. Epub 2022 Apr 12.

## Hyphal systems and their effect on the mechanical properties of fungal sporocarps

Debora Lyn Porter<sup>1</sup>, Steven E Naleway<sup>2</sup>

Affiliations + expand

PMID: 35421618 DOI: [10.1016/j.actbio.2022.04.011](https://doi.org/10.1016/j.actbio.2022.04.011)

FULL TEXT LINKS



ACTIONS

“ Cite

📁 Collections

Porter DL, Naleway SE. Hyphal systems and their effect on the mechanical properties of fungal sporocarps. *Acta Biomater.* 2022 Jun;145:272-282. doi: 10.1016/j.actbio.2022.04.011. Epub 2022 Apr 12. PMID: 35421618.



*Ganoderma tsugae*

When dissecting and examining a piece of a mushroom sporocarp (fruitbody) under the microscope, mycologists describe the type of cells they see making up the flesh in terms of the type of hyphae (i.e. monomitic, dimitic or trimitic).

What are hyphae? **Hyphae are filaments of mycelium. Mushrooms are made of mycelium.**

# Amadou & Reishi to Bees Against Deformed Wing Virus (DWV) and Lake Sinai Virus (LSV) at 12 Days

Amadou (*Fomes fomentarius*) vs. DWV > 879:1      p=0.005  
Reishi (*Ganoderma resinaceum*) vs. DWV = 79:1      p=0.0001  
vs. LSV = 45,000:1      p=0.009

www.nature.com/scientificreports

## SCIENTIFIC REPORTS

OPEN

### Extracts of Polypore Mushroom Mycelia Reduce Viruses in Honey Bees

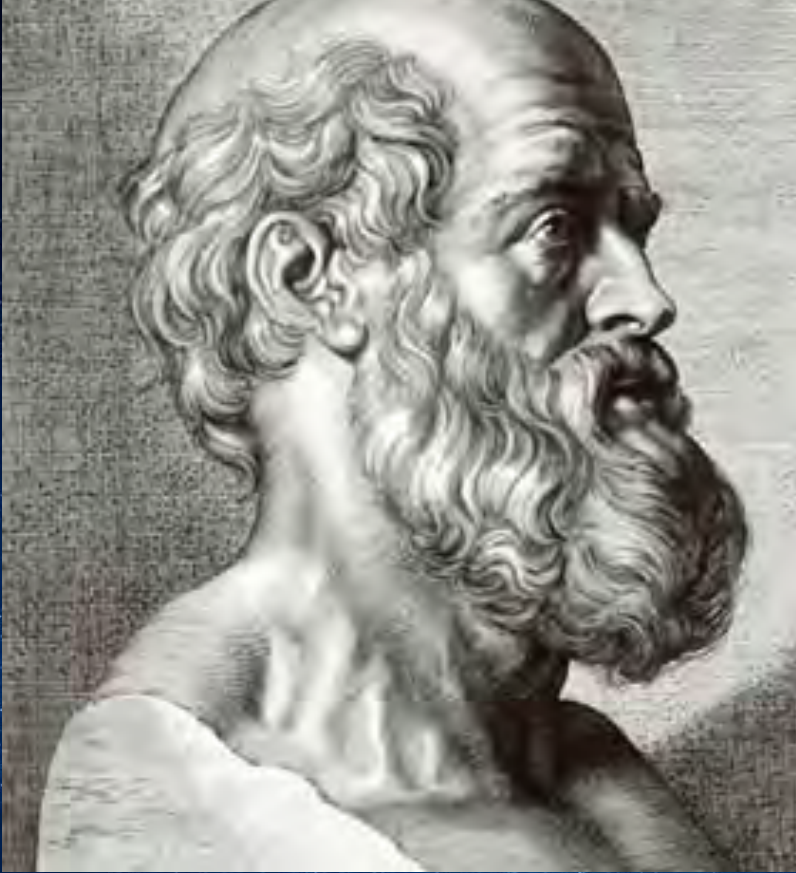
Paul E. Stamets<sup>1</sup>, Nicholas L. Naeger<sup>2</sup>, Jay D. Evans<sup>3</sup>, Jennifer O. Han<sup>2</sup>, Brandon K. Hopkins<sup>2</sup>, Dawn Lopez<sup>3</sup>, Henry M. Moershel<sup>1</sup>, Regan Nally<sup>1</sup>, David Sumerlin<sup>1</sup>, Alex W. Taylor<sup>1</sup>, Lori M. Carris<sup>2</sup> & Walter S. Sheppard<sup>2</sup>

Received: 24 April 2018  
Accepted: 29 August 2018  
Published online: 04 October 2018

Waves of highly infectious viruses sweeping through global honey bee populations have contributed to recent declines in honey bee health. Bees have been observed foraging on mushroom mycelium, suggesting that they may be deriving medicinal or nutritional value from fungi. Fungi are known to produce a wide array of chemicals with antimicrobial activity, including compounds active against bacteria, other fungi, or viruses. We tested extracts from the mycelium of multiple polypore fungal species known to have antiviral properties. Extracts from amadou (*Fomes*) and reishi (*Ganoderma*) fungi reduced the levels of honey bee deformed wing virus (DWV) and Lake Sinai virus (LSV) in a dose-dependent manner. In field trials, colonies fed *Ganoderma resinaceum* extract exhibited a 79-fold reduction in DWV and a 45,000-fold reduction in LSV compared to control colonies. These findings indicate honey bees may gain health benefits from fungi and their antimicrobial compounds.

I have never seen such strong antiviral activity against bee viruses as I have seen with Stamets's extracts "

—Jay Evans, Ph.D.  
Agricultural Research Services, USDA



Hippocrates — c. 460 – c. 370 BC

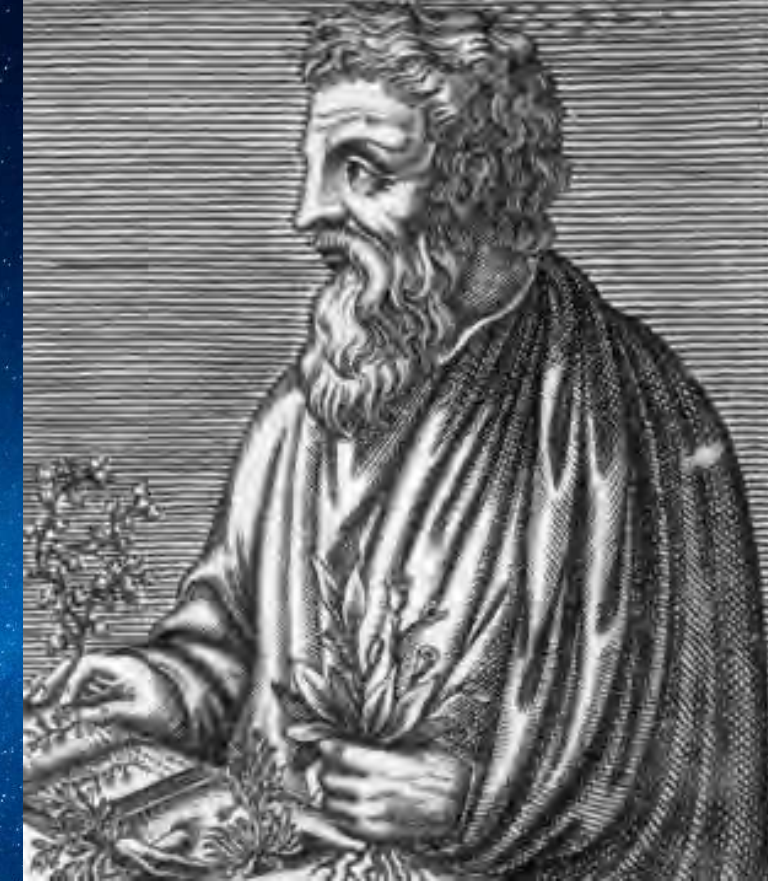
Physician, philosopher, naturalist

“let food be thy medicine and  
medicine be thy food.”



Agarikon was described by  
Dioscorides as

“Elixirium ad longam vitam”  
The Elixir of Long Life



Dioscorides — 40-90 AD

Physician, pharmacologist,  
botanist and author of  
*De Materia Medica*

*Mycologia*, 84(1), 1992, pp. 119–124.

© 1992, by The New York Botanical Garden, Bronx, NY 10458-5126

**NINETEENTH CENTURY SHAMAN GRAVE GUARDIANS ARE CARVED  
*FOMITOPSIS OFFICINALIS* SPOROPOHORES**

ROBERT A. BLANCHETTE<sup>1</sup>

*Department of Plant Pathology, University of Minnesota, St. Paul, Minnesota 55108*

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*Royal British Columbia Museum, Victoria British Columbia V8V 1X4, Canada*

AND

ROBERT L. GILBERTSON

*Department of Plant Pathology, University of Arizona, Tucson, Arizona 85721*

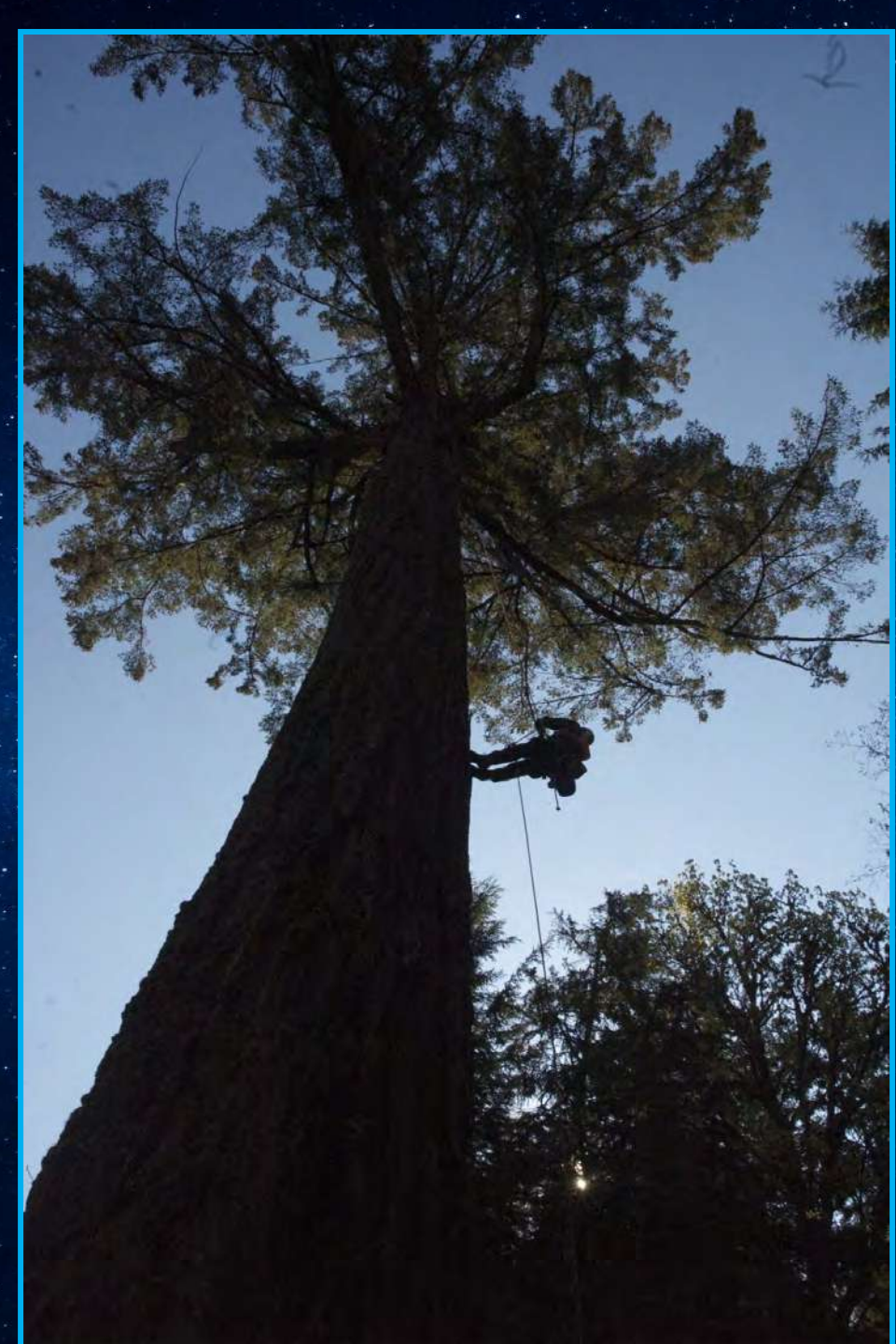


The Greeks and the First Peoples of British Columbia used Agarikon (*Fomitopsis officinalis*) as a topical poultice to reduce muscle aches and a styptic to stop bleeding.



Photo by Pamela Kryskow, MD

The habitat for Agarikon, one of several indicator species of what defines an old growth forest.



Agarikon grows almost exclusively in old growth forests and is on the **RED LIST** of endangered species in Europe.



Photo by Chris Giorgi

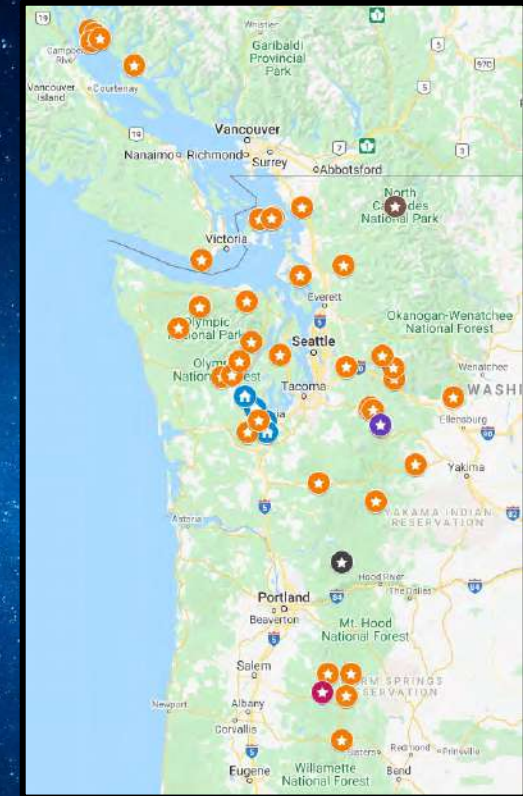
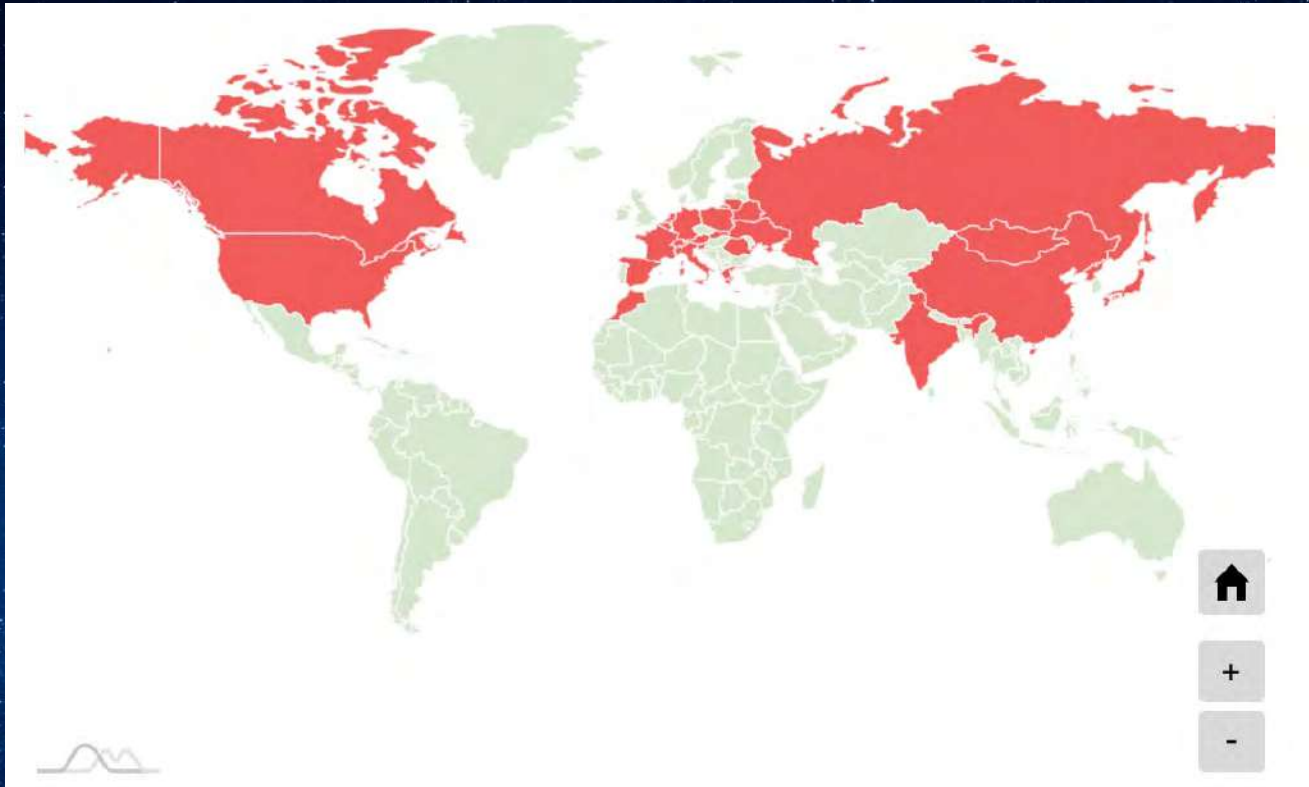


AGARIKON in the upper  
Snoqualmie River Watershed,  
Cascades, Washington State  
Recording GPS coordinates.  
Tissue clone and culture.





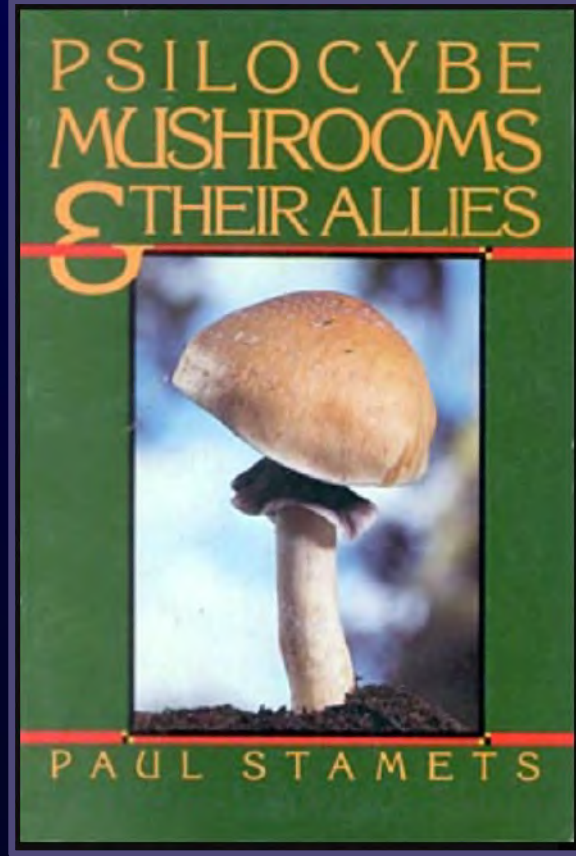
Agarikon, *Fomitopsis (Laricifomes) officinalis* isolates display unique genetic variation.



Agarikon is on the national **Red Lists** of threatened species in Austria, France, Germany, Lithuania, Poland, Russia (regional Red Data Books), Slovakia, Switzerland. It is protected by law in Germany, Lithuania, Poland and Slovenia. Increasing rare.

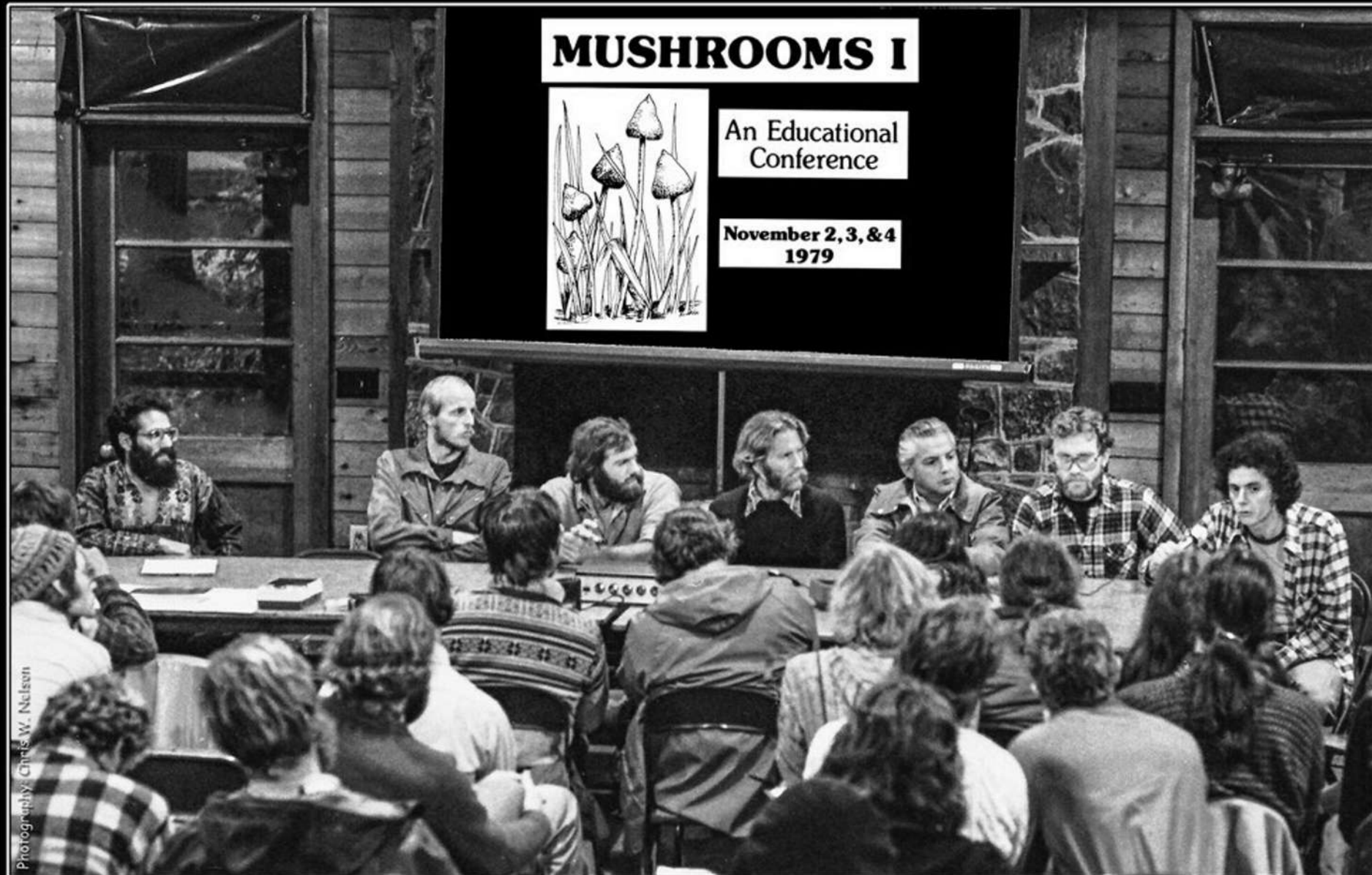
Our culture library consists of 93 strains of Agarikon, collected over 40+ years of field trips into the old growth forests. Once we have 100 strains, we hope to publish the entire genomes.

The content on this page is fetched from The IUCN Red List of Threatened Species: <https://www.iucnredlist.org/species/75104087/75104095>



45+ years ago, In 1978, I presented to my mother & brother John my book on psilocybin mushrooms,  
*Psilocybe Mushrooms & their Allies*

Steve Pollock, M.D., James Q. Jacobs, Paul E. Stamets, Dale T. Leslie, Gaston Guzman, PhD, Jeremy Bigwood and Jonathan Ott

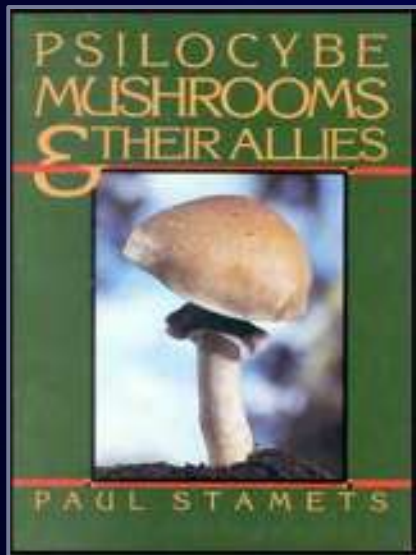


Photography: Chris W. Nilsson

Florence, Oregon

Mushrooms I Panel

4 November 1979

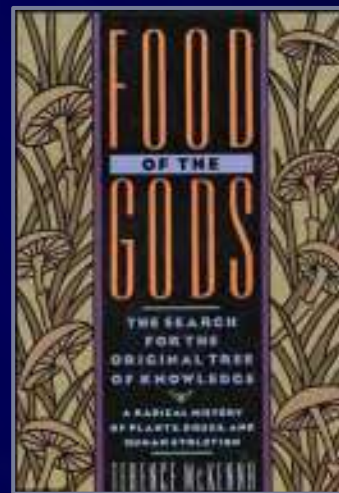
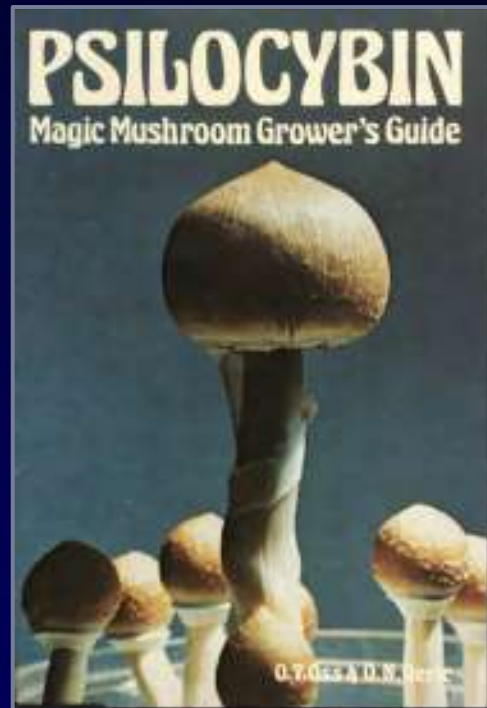


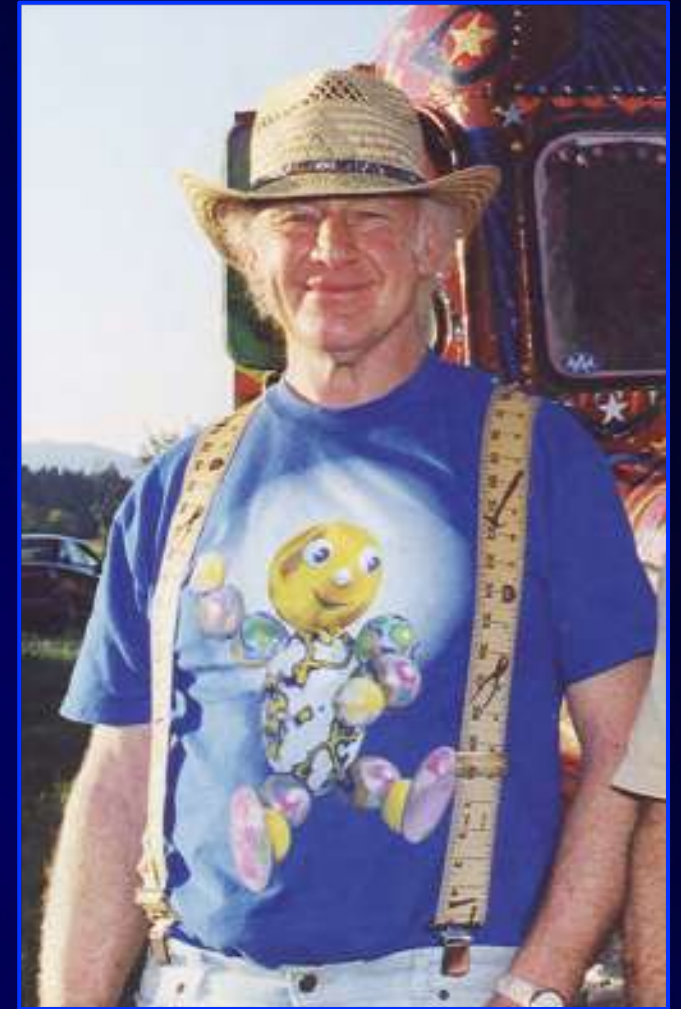
PHOTOGRAPH BY CHRIS W. NELSON

Paul, LaDena and Terence

Breitenbush Hot Springs, Oregon

27 October 1983





The Millennium Mushroom Conference Oct. 28-31<sup>st</sup> 1999



Distribution of 5,682 psilocybin mushroom collections from 1800-2022  
~141 known psilocybin active species.



*Psilocybe azurescens*



*Psilocybe stametsii*



*Psilocybe weilii*

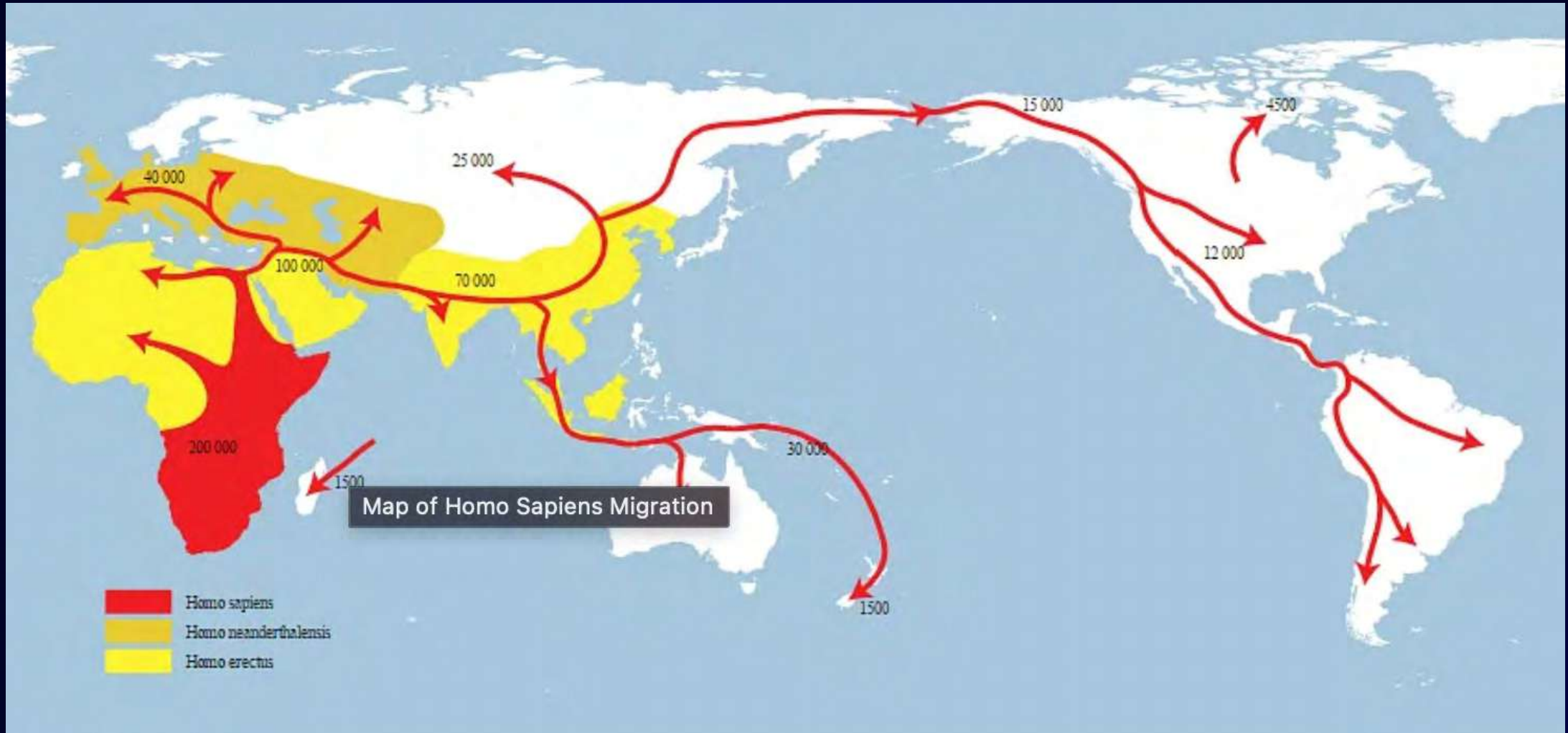


*Psilocybe cyanofibrillosa*



*Psilocybe liniformans*  
var. *americana*

Psilocybin mushroom research covered by a DEA license supervised by Dr. Michael Beug, The Evergreen State College 1977. On 2/24/2023, we received DEA license (RF0644852), first in Washington State.



Map of human migration (*Homo sapiens*, *H. neantheralensis*, *H. erectus*) from Africa. *Homo sapiens* colonized the Americas 15,000 - 20,000 years ago.





by Jonathan Meader



“Spores” or “Ideas” between mushrooms and humans?



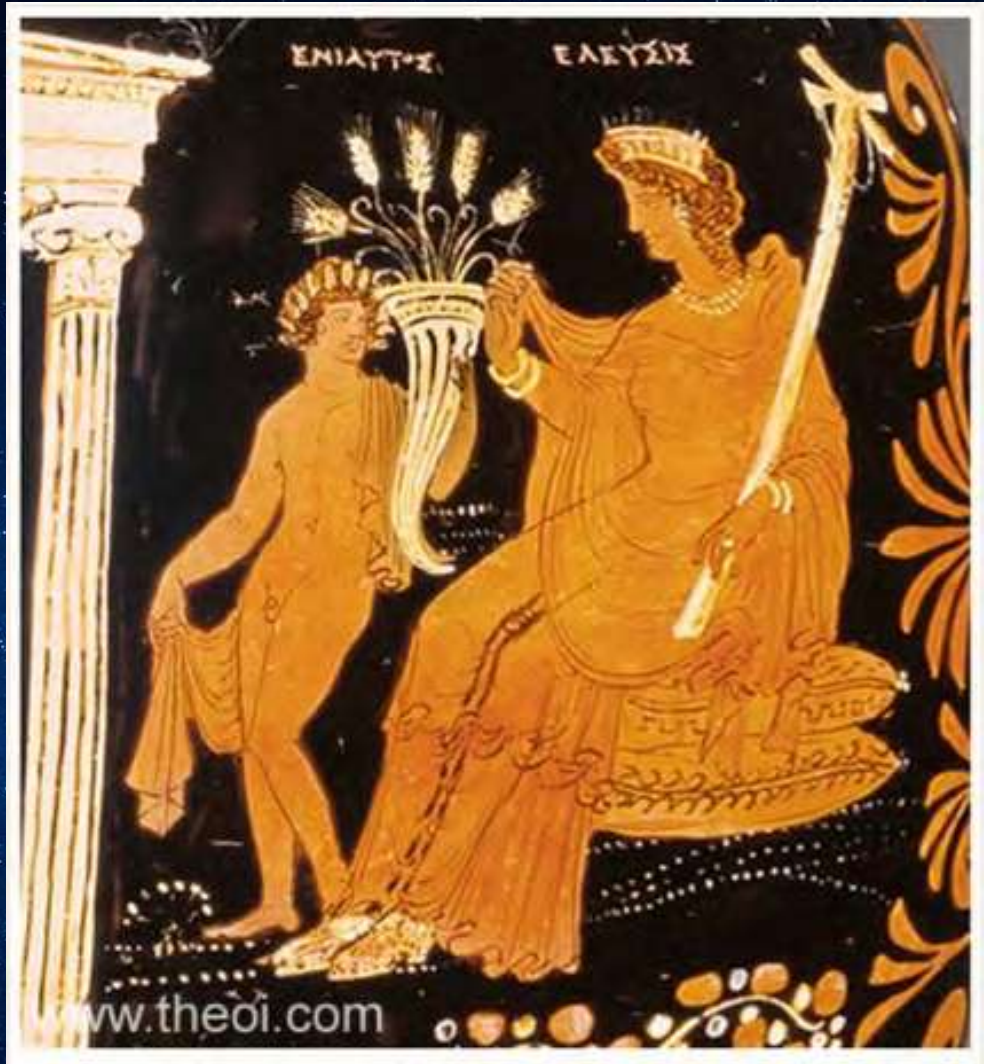
Aurochs (*Bos taurus*), extinct predecessor to modern long horn cows

Tassili Cave Art, Algeria, Northern Africa. ~ 7000 years BP

Aurochs (*Bos taurus*),  
extinct predecessor  
to modern long horn  
cows



Akers BP, Ruiz JF, Piper A, Ruck CA. (2011). "A prehistoric mural in Spain depicting neurotropic *Psilocybe* mushrooms?". *Economic Botany*. ~ 6000 BP.



Demeter giving Persephone a Mushroom ~ 400 BCE  
Eleusinian Mysteries ~1500 BCE to 200 CE



Photo by Dr. Pamela Kryskow



Did the Ancient Egyptians use psilocybin mushrooms ?

# Goddess Hathor: Dendera Temple



In the Egyptian Book of the Dead, the papyrus of Ani, mushrooms are called 'flesh of the gods'. The Aztec name Teonanacatl has the same translation.

Common people were banned from picking them.

Dr. Ahmed Abdel-Azeem (2016) proposed *Psilocybe cubensis* is featured here.

Abdel-Azeem, M. A., Blanchette, R. A., Mohesien, M. T., Salem, F. M. & Abdel-Azeem, M. A. 2016: The conservation of mushroom in ancient Egypt through the present. – Pp. 1-2 in: The First International Conference on Fungal Conservation in the Middle East and North of Africa (ICFC), 18-20 October, 2016. – Ismailia.

Stephen Berlant (2005) proposed that Ancient Egyptians used psilocybin mushrooms in 2005. (Ethnopharmacol Nov 14;102(2):275-88. doi: 10.1016/j.jep.2005.07.028.Epub 2005 Sep 30.



*Psilocybe cubensis* is native to Africa, the most frequently grown and consumed psilocybin mushroom species. This species has migrated with humans, cattle and egrets.



Blue Lotus (*Nymphaea caerulea*), a water lily is considered sacred in Egypt, symbolizing life, immortality and rebirth.











*Psilocybe cubensis* growing on cow and elephant dung



*Map showing The Selva Pascuala cave near Villar del Humo in Spain, The Telestrion at Eleusis in Greece, The Temple Hathor in Egypt, and The Tassili n'Ajjer caves in Algeria.*

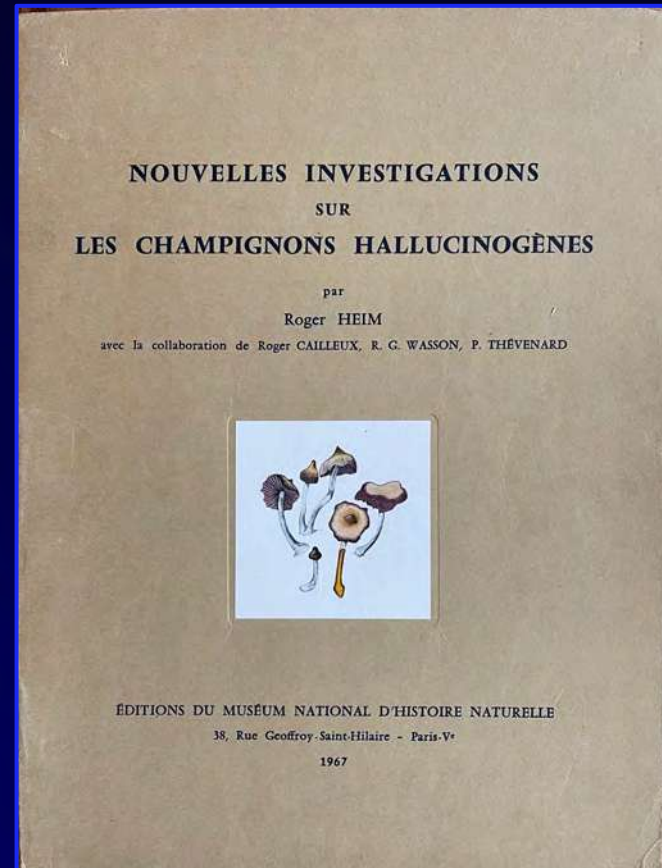
*7000 BC to 400 AD*

*"These they ate before dawn with **honey**,  
and they also drank **cacao** before dawn.*

*...they began to dance, and some sang, and  
some wept . . . Some cared not to sing, but  
would sit down in their rooms, and stayed  
there pensive-like.*

*Then when the drunkenness of the  
mushrooms had passed, they spoke one with  
another about the visions that they had  
seen."*

Spanish missionary priest Bernardino de Sahagún, ~ 1529



In Europe, the Reinheitsgebot

“The Bavarian Beer Act”

Banned addition of mushrooms in 1516



Maria Sabina with apprentices.



R. Gordon and Valentina Wasson are befriended by the Dorantes family, close allies of Maria Sabina. 1955.



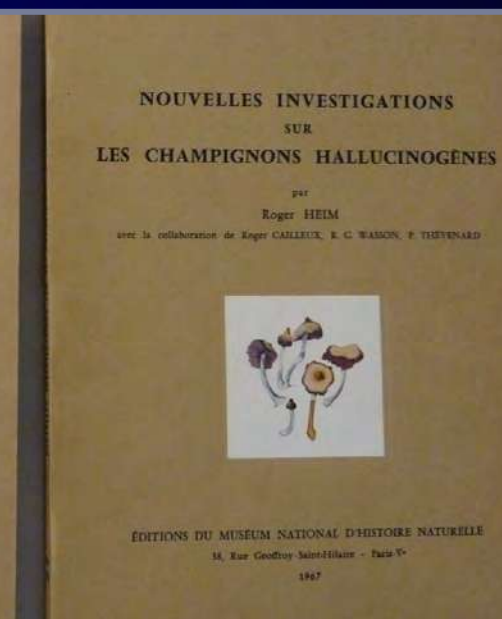
*Psilocybe caerulescens*

Photo by Inti Garcia Flores.



Ethnobotanists Blas Pablo Reko & Richard Evans Schultes were given psilocybin mushrooms in 1939. These contacts were passed on to the Wassons, who then met Maria Sabina.

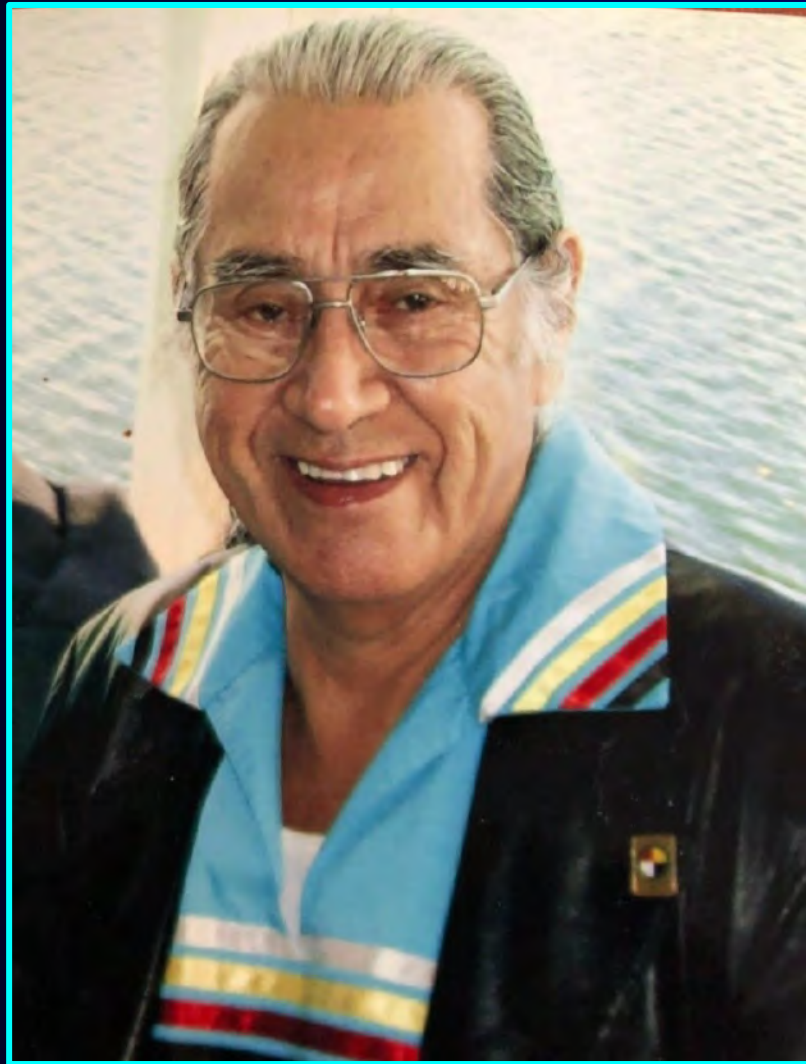
Group photos of Maria Sabina and the Wassons provided by Inti, son of Renato Garcia Dorantes & Chojn Chijne María Sabina Archive.





*Psilocybe cubensis* grown on soil cased, sterilized grain.

One flush yielded the equivalent of ~1/3 conversion of dried mass of mushrooms from dried mass of substrate.



*“Two-Eyed Seeing refers to learning to see from one eye with the strengths of Indigenous ways of knowing and from the other eye with the strengths of Western ways of knowing and to using both of these eyes together.”*

Bartlett, C., Marshall, M., Marshall, A. (2012). Two-eyed seeing and other lessons learned within a co-learning journey of bringing together indigenous and mainstream knowledges and ways of knowing. *Journal of Environmental Studies and Sciences*, 2, 331–340.

*Elder Albert Marshall of the  
Mi'kmawis the recipient of the 2022 Dr.  
Thomas Dignan Indigenous Health Award  
Eskasoni First Nation*



*Melissa Nelson, The Cultural Conservancy.  
<https://www.nativeland.org/melissa-k-nelson>*

*Re-Indigenization refers to*

- (i) embracing Indigenous world- views of ecologies and M's-it No 'kmaq*
- (ii) learning from Indigenous languages of the land*
- (iii) Natural laws and Netukulimk*
- (iv) correct relationships*
- (v) total reflection and truth*
- (vi) Etuaptmumk—“two-eyed seeing,” and “strong like two people”*
- (vii) (vii) “story-telling/ story-listening”*

M's-it No'kmaq, Marshall A, Beazley KF, Hum J, Joudry S, Papadopoulos A, Pictou S, Rabesca J, Young L, and Zurba M. 2021. “Awakening the sleeping giant”: re-Indigenization principles for transforming biodiversity conservation in Canada and beyond. *FACETS* 6: 839–869. doi:10.1139/ facets-2020-0083



## U.S. State Legislation and Ballot Measure Status for Psilocybin and/or Other Psychedelics

State	Status	State	Status
California	Pushed to next session	New Hampshire	Passed Senate, failed in House
Colorado	Law	New Jersey	Bill passed
Connecticut	Passed in budget bill	New York	Awaiting first hearing
Florida	Bill died in committee	Oklahoma	Bill passed
Georgia	Awaiting first hearing	Oregon	Law
Hawaii	Passed in Senate	Pennsylvania	Currently in House
Kansas	Bill died in committee	Rhode Island	Pushed to next session
Maryland	Bill passed	Texas	Bill passed
Massachusetts	Two bills proposed	Utah	Bill passed
Maine	Passed Senate, failed in House	Virginia	Pushed to next session
Missouri	Awaiting first hearing	Washington	Bill passed

28 States have had or actively have ballots and bills in process.



**80% of Canadians believe psilocybin mushrooms should be legal for medical purposes.**

**Nanos poll in 2021 78% favor  
Pollara poll in 2022 80% favor**

<https://therapsil.ca/wp-content/uploads/2023/01/Public-Perception-Poll-3.pdf>

Legal in Jamaica, Bahamas, Netherlands, Portugal.  
Australia for psilocybin for depression.

485,185 people surveyed  
by U.S. Department of Health and Human Services

Original Paper

## The relationships of classic psychedelic use with criminal behavior in the United States adult population

Peter S Hendricks<sup>1</sup>, Michael Scott Crawford<sup>1</sup>, Karen L Cropsey<sup>2</sup>,  
Heith Copes<sup>3</sup>, N Wiles Sweat<sup>1</sup>, Zach Walsh<sup>4</sup> and Gregory Pavela<sup>1</sup>



Journal of Psychopharmacology  
1-12

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DOI: 10.1177/0269881117735685

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Psychedelics, particularly psilocybin mushroom use was associated with a

- 27% decreased odds of past year larceny/theft
- 22% decreased odds for a property crime
- 18% decreased odds for a violent crime

*“Results are therefore consistent with a protective effect of psilocybin for antisocial criminal behavior.”*

...1,266 Community Members aged 16–70

Original Article

## Psychedelic use and intimate partner violence: The role of emotion regulation

Michelle S Thiessen<sup>1</sup>, Zach Walsh<sup>1</sup>, Brian M Bird<sup>2</sup> and Adele Lafrance<sup>3</sup>

Psychopharm

Journal of Psychopharmacology  
1–7

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DOI: 10.1177/0269881118771782

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### Abstract

**Background:** Recent evidence suggests that psychedelic use predicts reduced perpetration of intimate partner violence among men involved in the criminal justice system. However, the extent to which this association generalizes to community samples has not been examined, and potential mechanisms underlying this association have not been directly explored.

**Aims:** The present study examined the association between lifetime psychedelic use and intimate partner violence among a community sample of men and women. The study also tested the extent to which the associations were mediated by improved emotion regulation.

**Methods:** We surveyed 1266 community members aged 16–70 (mean age=22.78, standard deviation=7.71) using an online questionnaire that queried substance use, emotional regulation, and intimate partner violence. Respondents were coded as psychedelic users if they reported one or more instance of using lysergic acid diethylamide and/or psilocybin mushrooms in their lifetime.

**Results/outcomes:** Males reporting any experience using lysergic acid diethylamide and/or psilocybin mushrooms had decreased odds of perpetrating physical violence against their current partner (odds ratio=0.42,  $p<0.05$ ). Furthermore, our analyses revealed that male psychedelic users reported better emotion regulation when compared to males with no history of psychedelic use. Better emotion regulation mediated the relationship between psychedelic use and lower perpetration of intimate partner violence. This relationship did not extend to females within our sample.

**Conclusions/interpretation:** These findings extend prior research showing a negative relationship between psychedelic use and intimate partner violence, and highlight the potential role of emotion regulation in this association.

*“Males reporting any experience using lysergic acid diethylamide and/or psilocybin mushrooms had decreased odds of perpetrating physical violence against their current partner ( $p<0.05$ ).”*

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Article | [Open Access](#) | [Published: 07 April 2022](#)

## **Associations between classic psychedelics and opioid use disorder in a nationally-representative U.S. adult sample**

“Psilocybin was the only psychedelic associated with lowered odds of OUD (Opioid Use Disorder)”

Sample Size: N = 214,505 Adults

# Among psychedelic-experienced users, only past use of psilocybin reliably predicts nature relatedness

Matthias Forstmann<sup>1</sup> , Hannes S Kettner<sup>2,3</sup> , Christina Sagioglou<sup>4</sup>, Alexander Irvine<sup>5</sup> , Sam Gandy<sup>3</sup>, Robin L Carhart-Harris<sup>2</sup>  and David Luke<sup>3,5</sup>



*Journal of Psychopharmacology*  
1-14

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DOI: 10.1177/02698811221146356

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*“Among people experienced with psychedelics, [only past use of psilocybin](#) (versus LSD, mescaline, Salvia divinorum, ketamine, and ibogaine) was a reliable predictor of NR and its subdimensions.”*

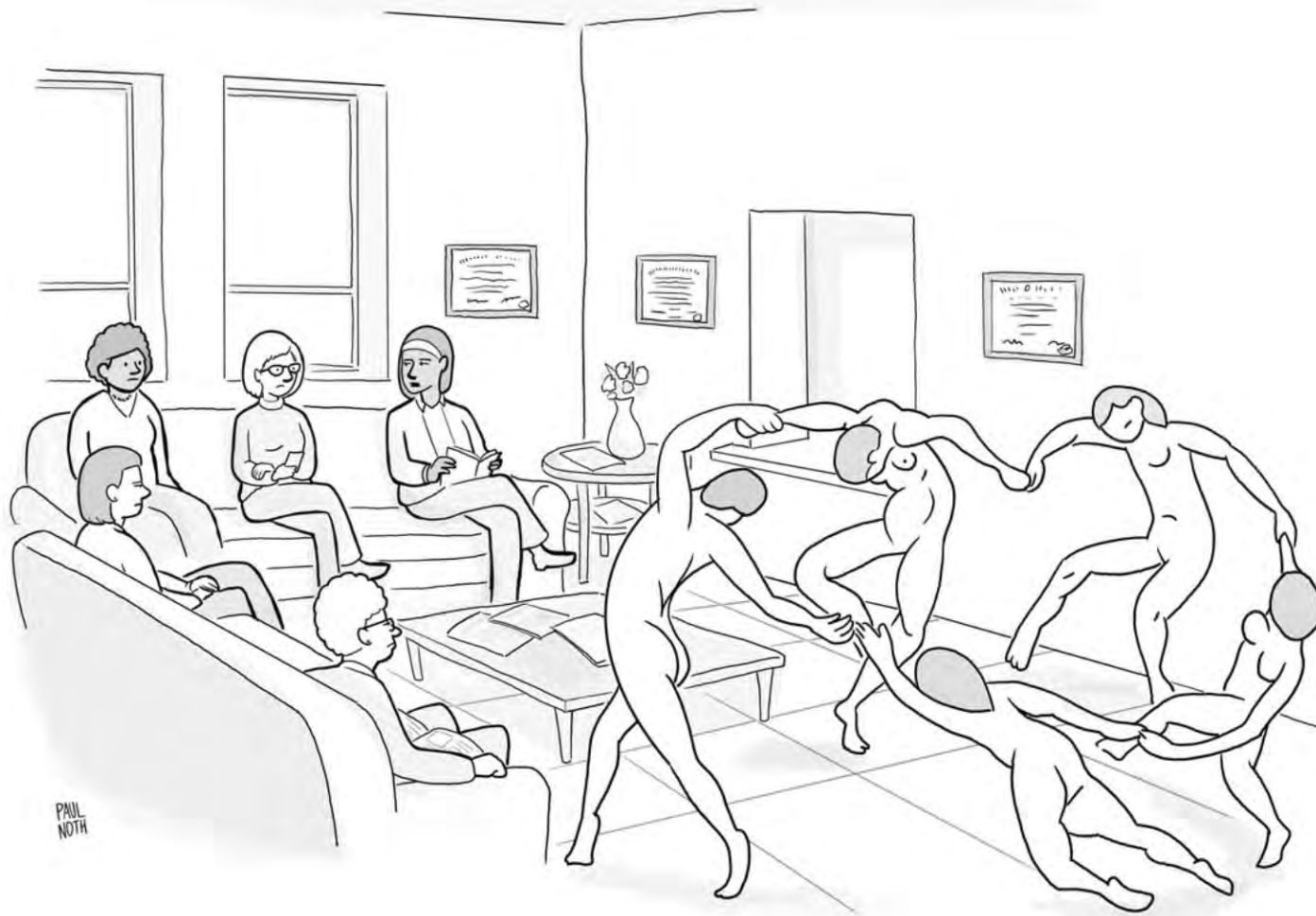
Sample Size: N = 3817 Adults

# 129 Universities & Institutions

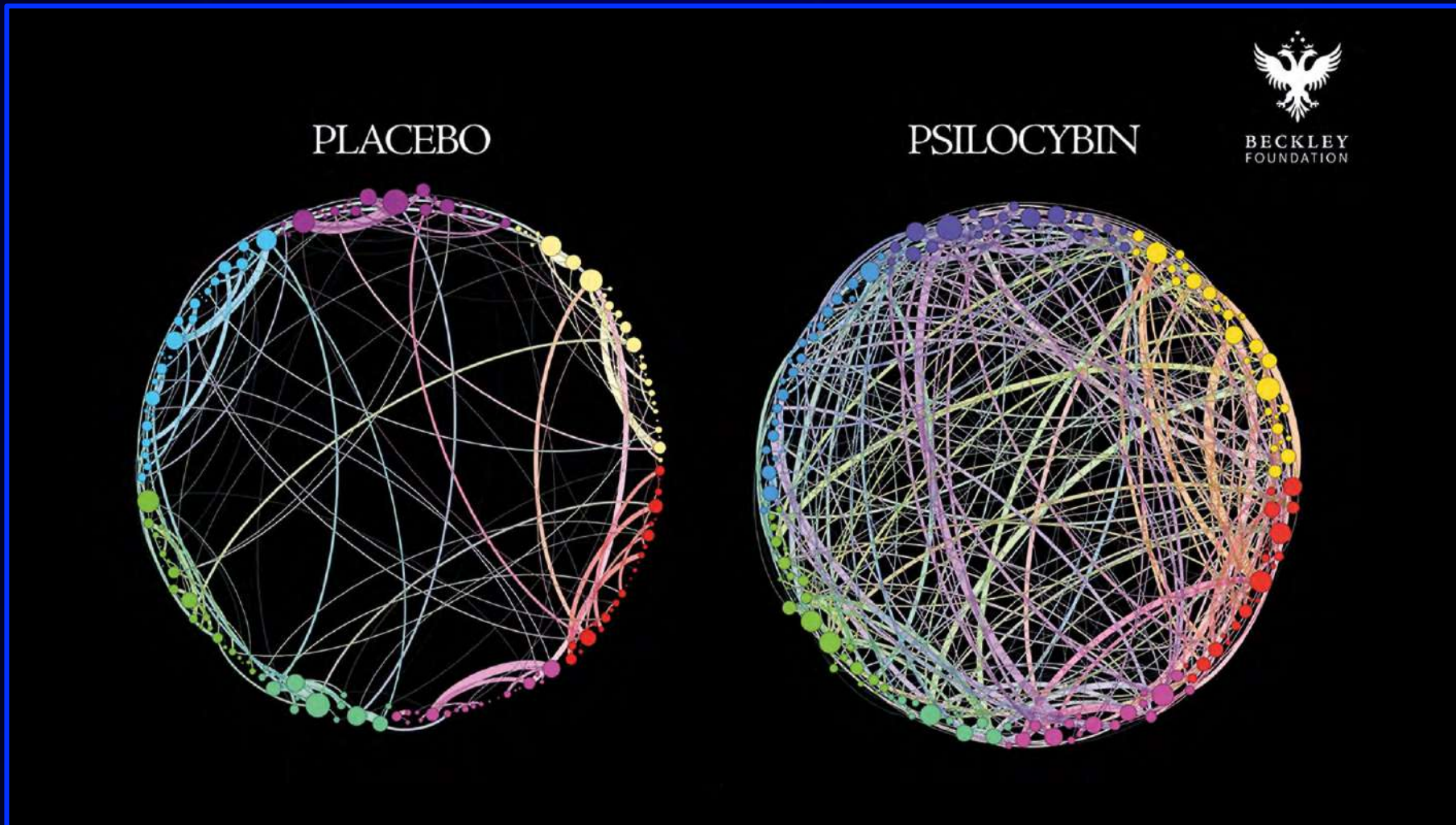
currently registered for clinical studies on psilocybin. Typically therapeutic “high” dosages = 25–40 mg psilocybin



13 clinical trials using niacin opposite psilocybin as an active placebo.



*“So I’m guessing we’re in the placebo group.”*



Homological model shows functional links across previously disconnected brain regions, temporarily altering the brain's entire organizational framework.



## Psilocybin produces substantial and sustained decreases in depression and anxiety in patients with life-threatening cancer: A randomized double-blind trial

Roland R Griffiths<sup>1,2</sup>, Matthew W Johnson<sup>1</sup>, Michael A Carducci<sup>3</sup>, Annie Umbricht<sup>1</sup>, William A Richards<sup>1</sup>, Brian D Richards<sup>1</sup>, Mary P Cosimano<sup>1</sup> and Margaret A Klinedinst<sup>1</sup>



Journal of Psychopharmacology  
2016, Vol. 30(12) 1181–1197  
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DOI: 10.1177/0269881116675513  
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## Single-dose psilocybin-assisted therapy in major depressive disorder: A placebo-controlled, double-blind, randomised clinical trial

Robin von Rotz,<sup>a,\*</sup> Eva M. Schindowski,<sup>a</sup> Johannes Jungwirth,<sup>a</sup> Anna Schuldt,<sup>a</sup> Nathalie M. Rieser,<sup>a</sup> Katharina Zahoranszky,<sup>a</sup> Erich Seifritz,<sup>b</sup> Albin Nowak,<sup>b</sup> Peter Nowak,<sup>b</sup> Lutz Jäncke,<sup>c</sup> Katrin H. Preller,<sup>a,d</sup> and Franz X. Vollenweider<sup>a,d</sup>

<sup>a</sup>Neurophenomenology of Consciousness Lab, Department of Psychiatry, Psychotherapy and Psychosomatics, Psychiatric Hospital, University of Zurich, Zürich, Switzerland

<sup>b</sup>Department of Psychiatry, Psychotherapy and Psychosomatics, Psychiatric Hospital, University of Zurich, Zürich, Switzerland

<sup>c</sup>Division Neuropsychology, Department of Psychology, University of Zürich, Zürich, Switzerland

### Summary

**Background** Psilocybin has been suggested as a novel, rapid-acting treatment for depression. Two consecutive doses have been shown to markedly decrease symptom severity in an open-label setting or when compared to a waiting list group. To date, to our knowledge, no other trial compared a single, moderate dose of psilocybin to a placebo condition.



eClinicalMedicine  
2023;56: 101809

Published Online xxx  
<https://doi.org/10.1016/j.eclinm.2022.101809>

Clinical trials used 25 mg. (high dose) and 15 mg. (low dose).

### ORIGINAL ARTICLE

## Trial of Psilocybin versus Escitalopram for Depression

Robin Carhart-Harris, Ph.D., Bruna Giribaldi, B.Sc., Rosalind Watts, D.Clin.Psy., Michelle Baker-Jones, B.A., Ashleigh Murphy-Beiner, M.Sc., Roberta Murphy, M.D., Jonny Martell, M.D., Allan Blemings, M.Sc., David Erritzoe, M.D., and David J. Nutt, M.D.

### ABSTRACT

#### BACKGROUND

Psilocybin may have antidepressant properties, but direct comparisons between psilocybin and established treatments for depression are lacking.

#### METHODS

In a phase 2, double-blind, randomized, controlled trial involving patients with long-standing, moderate-to-severe major depressive disorder, we compared psilocybin with escitalopram, a selective serotonin-reuptake inhibitor, over a 6-week period. Patients were assigned in a 1:1 ratio to receive two separate doses of 25 mg of psilocybin 3 weeks apart plus 6 weeks of daily placebo (psilocybin group) or two separate doses of 1 mg of psilocybin 3 weeks apart plus 6 weeks of daily oral escitalopram (escitalopram group); all the patients received psychological support. The

*“...post-escitalopram changes in personality were significantly moderated by pre-trial positive expectancy for escitalopram, whereas expectancy did not moderate response to PT (Psilocybin Therapy).”*

<https://doi.org/10.1017/S0033291723001514>

Clinical Trial > [Am J Drug Alcohol Abuse](#). 2017 Jan;43(1):55-60.

doi: [10.3109/00952990.2016.1170135](#). Epub 2016 Jul 21.

## Long-term follow-up of psilocybin-facilitated smoking cessation

[Matthew W Johnson](#)<sup>1</sup>, [Albert Garcia-Romeu](#)<sup>1</sup>, [Roland R Griffiths](#)<sup>1 2</sup>

Affiliations + expand

PMID: [27441452](#) PMCID: [PMC5641975](#) DOI: [10.3109/00952990.2016.1170135](#)



“67% were smoking abstinent in one year follow up.

87% rated their psilocybin experiences among the five most personally meaningful and spiritually significant experiences of their lives.”

## Original Investigation

August 24, 2022

ONLINE FIRST 

# Percentage of Heavy Drinking Days Following Psilocybin-Assisted Psychotherapy vs Placebo in the Treatment of Adult Patients With Alcohol Use Disorder A Randomized Clinical Trial

Michael P. Bogenschutz, MD<sup>1</sup>; Stephen Ross, MD<sup>1</sup>; Snehal Bhatt, MD<sup>2</sup>; et al

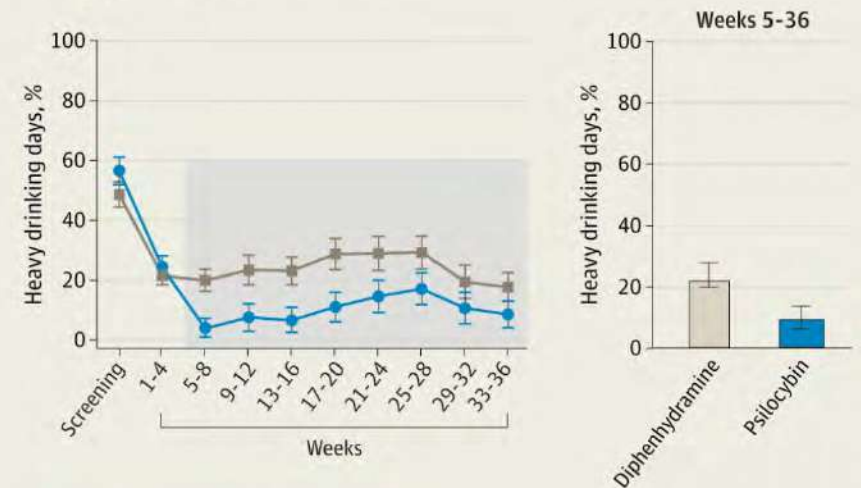
[» Author Affiliations](#) | [Article Information](#)

*JAMA Psychiatry*. Published online August 24, 2022. doi:10.1001/jamapsychiatry.2022.2096

**Findings** In this double-blind randomized clinical trial with 93 participants, the percentage of heavy drinking days during 32 weeks of follow-up was significantly lower in the psilocybin group than in the diphenhydramine group.

## FINDINGS

Percent heavy drinking days during the 32-wk double-blind period was lower in the psilocybin group compared with the diphenhydramine group



25 mg and 50 mg psilocybin sessions 4 weeks apart.

# *Psilocybe cubensis* (Pc) at 1% psilocybin.

## Macro dosing: Perceptual/Intoxicating

> 10 mg. mild (1 gram Pc)

>25 mg. therapeutic (2.5 grams Pc)

## Micro dosing: Non-intoxicating

~ 1 mg. (.1 grams Pc)

# Microdosing with dried psilocybin mushrooms

(presumption: *Psilocybe cubensis*) ~ 1% psilocybin/psilocin

1 gram dried mushrooms = 10 mg

(1/10th gram mushrooms = 1 mg)

- Low Dose <.10 grams – 16% of respondents
- Med Dose .10–.30 grams – 72% of respondents
- High Dose >.30 grams – 12% of respondents

Majority microdosed 3–5x per week



Rootman et al. Scientific Reports 2021

>90% of microdosers used *Psilocybe cubensis*.



Frontiers in Aging Neuroscience | Sections | Articles | Research Topics | Editorial Board | About Journal

CLINICAL TRIAL article  
 Front. Aging Neurosci., 03 June 2020  
 Sec. Alzheimer's Disease and Related Dementias  
<https://doi.org/10.3389/fnagi.2020.00155>

This article is part of the Research Topic  
 Translational Advances in Alzheimer's, Parkinson's, and other Neurodegenerative Dementias  
[View 31/70 Articles](#)

### Prevention of Early Alzheimer's Disease by Erinacine A-Enriched *Hericium erinaceus* Mycelia Pilot Double-Blind Placebo-Controlled Study

I-Chen Li<sup>1</sup>, Han-Hsin Chang<sup>2</sup>, Chuan-Han Lin<sup>3</sup>, Wan-Ping Chen<sup>1</sup>, Tsung-Han Lu<sup>2</sup>,  
 Li-Ya Lee<sup>1</sup>, Yu-Wen Chen<sup>1</sup>, Yen-Po Chen<sup>1</sup>, Chin-Chu Chen<sup>1,4,5,6\*</sup> and  
 David Pei-Cheng Lin<sup>3,7\*</sup>

PHYTOTHERAPY RESEARCH  
*Phytother. Res.* **23**, 367–372 (2009)  
 Published online 10 October 2008 in Wiley InterScience  
 (www.interscience.wiley.com) DOI: 10.1002/ptr.2634

### Improving Effects of the Mushroom Yamabushitake (*Hericium erinaceus*) on Mild Cognitive Impairment: A Double-blind Placebo-controlled Clinical Trial

Koichiro Mori<sup>1\*</sup>, Satoshi Inatomi<sup>1</sup>, Kenzi Ouchi<sup>1</sup>, Yoshihito Azumi<sup>1</sup> and Takashi Tsuchida<sup>2</sup>

<sup>1</sup>Mushroom Laboratory, Hokuto Corporation, 800-8, Shimokomazawa, Nagano, 381-0008, Japan  
<sup>2</sup>Isogo Central and Neurosurgical Hospital, 1-16-26, Mori, Isogoku, Yokohama, 235-0023, Japan



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RESEARCH ARTICLE | Volume 6 - Issue 1

### *Hericium erinaceus* Mycelium Exerts Neuroprotective Effect in Parkinson's Disease-*in vitro* and *in vivo* Models

Pao-Pao Yang<sup>1,2</sup>, Chih-Yung Lin<sup>2</sup>, Tzu-Yin Lin<sup>2</sup>, and Win-Chin Chiang<sup>2\*</sup>

<sup>1</sup>Institute of Biotechnology and Pharmaceutical Research, National Health Research Institutes, Miaoli County, Taiwan, Republic of China  
<sup>2</sup>JOWIN BIOPHARMA Inc, Taiwan, Republic of China

\*Corresponding author: Win-Chin Chiang, JOWIN BIOPHARMA Inc, Xizhi, New Taipei City, Taiwan, 9F-12, No. 97, Sec. 1, Xintai 5<sup>th</sup> Road, Xizhi Dist, New Taipei City, Taiwan (22175), E-mail: winchiang@jowinbio.com

Received: 20 Feb, 2020 | Accepted: 13 Mar, 2020 | Published: 20 Mar, 2020

The mycelium of Lions Mane contains erinacines; the fruitbodies do not!  
 Erinacines stimulate NGF (Nerve Growth Factors)

# LARGEST GLOBAL MICRODOSING STUDY



**100% anonymous,  
encrypted**

**Testing cognitive  
performance and  
mental health through  
validated tests and  
surveys**

**microdose.me**

# “The Stamets Stack”

A Nootropic Vitamin Formula for Neurogenesis & Neuroplasticity

(based on a 70 kg (154 lb))

psilocybin/psilocin	0.5-1.0 mg*
psilocybe mushroom @ 1%	0.05-0.10 g
erinacines/hericenones	.1-5 mg
lion's mane mushroom mycelium @ 1%	100-500 mg
niacin/nicotinic acid	25-50 mg
vitamin B3	

28% of Stackers (N=264) used the Stamets Stack 3-5x per week



3<sup>rd</sup> Most Downloaded Article in Nature's *Scientific Reports* in 2021

**scientific** reports

Article | [Open Access](#) |

[Published: 18 November 2021](#)

**Adults who microdose  
psychedelics report health  
related motivations and lower  
levels of anxiety and depression  
compared to non-microdosers**

[Joseph M. Rootman](#) , [Pamela Kryskow](#),

[\[...\] Zach Walsh](#)

*Scientific Reports* **11**, Article number: 22479

$n = 3486$

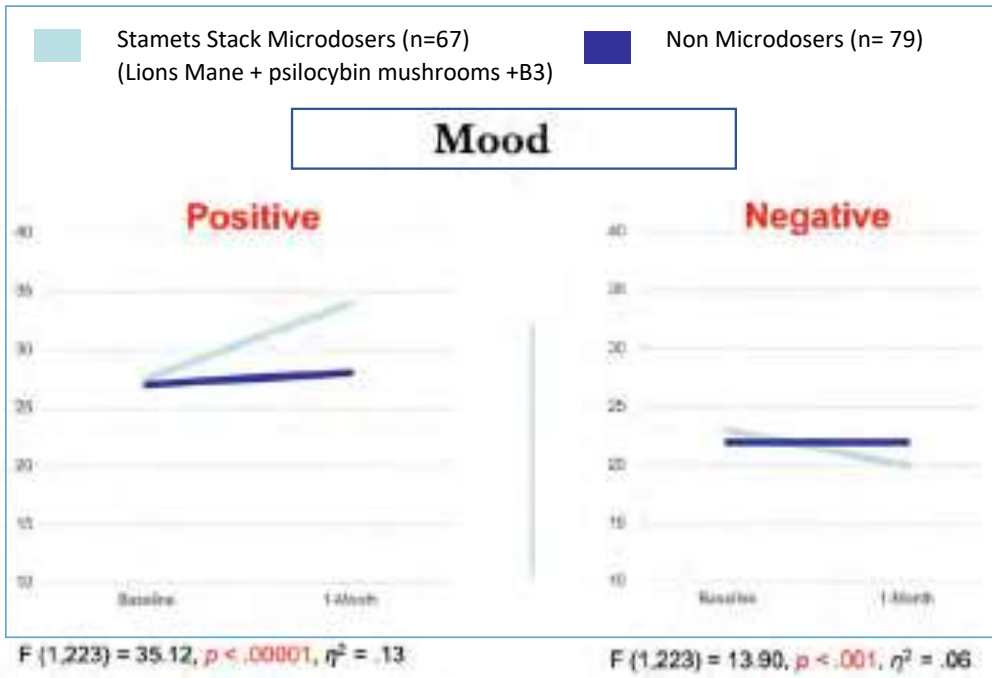
55% Stacked. 28% of Stackers (N=264) used

**“The Stamets Stack”**

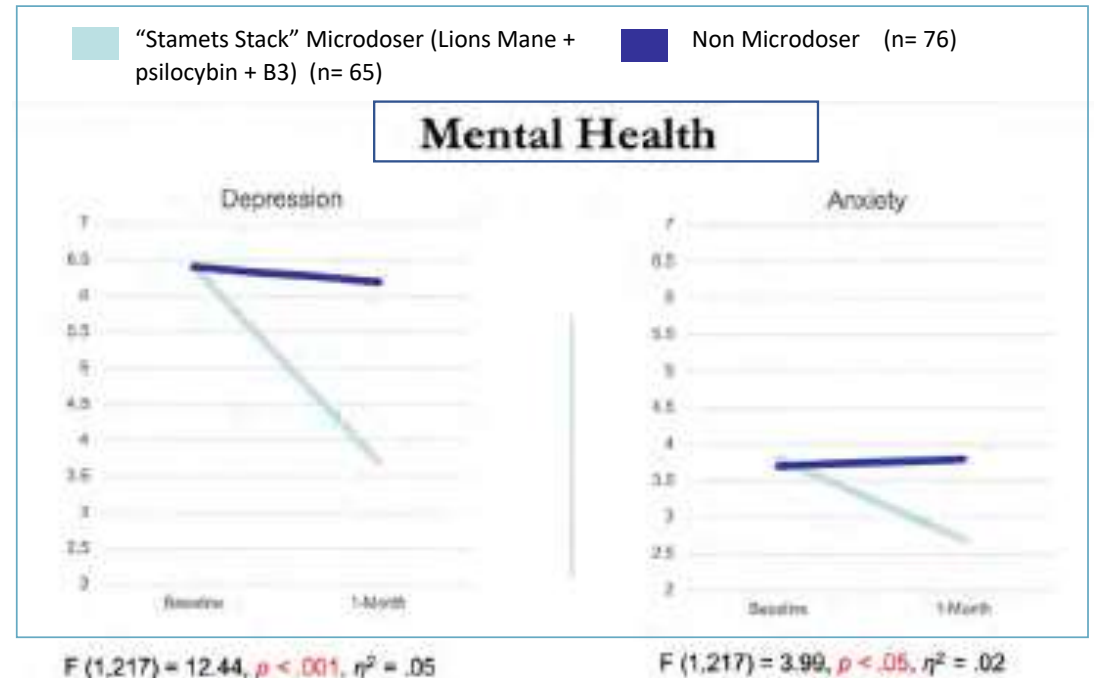
A combination of psilocybin mushrooms + Lion's  
Mane mushroom mycelium + niacin

# Microdose.me

(Data from >8000 participants)



Positive and Negative Affect Scale (PANAS) – Range 10-50



Depression Anxiety and Stress Scale (DASS 21) – Range 0-42

\*Preliminary Data. Not peer reviewed. For illustrative purposes.

# Finger Tapping Test

## Research Article

### Use of a Smartphone to Gather Parkinson's Disease Neurological Vital Signs during the COVID-19 Pandemic

Jay L. Alberts<sup>1,2</sup>, Mandy Miller Koop<sup>1</sup>, Marisa P. McGinley<sup>3</sup>, Amanda L. Penko<sup>1</sup>, Hubert H. Fernandez<sup>2,4</sup>, Steven Shook<sup>2</sup>, Robert A. Bermel<sup>3</sup>, André Machado<sup>2,4</sup>, and Anson B. Rosenfeldt<sup>1</sup>

<sup>1</sup>Cleveland Clinic, Lerner Research Institute, Department of Biomedical Engineering, Cleveland, OH, USA

<sup>2</sup>Cleveland Clinic, Neurological Institute, Center for Neurological Restoration, Cleveland, OH, USA

<sup>3</sup>Cleveland Clinic, Neurological Institute, Mellen Center for Multiple Sclerosis, Cleveland, OH, USA

<sup>4</sup>Cleveland Clinic, Lerner College of Medicine, Cleveland, OH, USA

Correspondence should be addressed to Jay L. Alberts; albertj@ccf.org

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Shirani et al. BMC Neurology (2017) 17:55  
DOI 10.1186/s12883-017-0829-y

BMC Neurology

RESEARCH ARTICLE

Оригинал статьи

CrossMark

### Finger tapping impairments are highly sensitive for evaluating upper motor neuron lesions

Afsaneh Shirani, Braeden D. Newton and Darin T. Okuda\*



ELSEVIER

Parkinsonism and Related Disorders 7 (2001) 305–309

Parkinsonism &  
Related Disorders

www.elsevier.com/locate/parkrelidis

### Alternating two finger tapping with contralateral activation is an objective measure of clinical severity in Parkinson's disease and correlates with PET [<sup>18</sup>F]-DOPA Ki

P.K. Pal, C.S. Lee, A. Samii, M. Schulzer, A.J. Stoessl, E.K. Mak, J. Wudel, T. Dobko, J.K.C. Tsui\*

Neurodegenerative Disorders Centre, Vancouver Hospital and Health Sciences Centre, University of British Columbia, Purdy Pavilion, 2221 Westbrook Mall, Vancouver, British Columbia, Canada V6T 2B5

Received 12 May 2000; revised 5 July 2000; accepted 10 July 2000

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Author manuscript  
Peer-reviewed and accepted for publication

About author manuscripts Submit a manuscript

Neuroimage, Author manuscript; available in PMC 2009 Aug 1.  
Published in final edited form as:  
Neuroimage. 2008 Aug 1; 42(1): 343–356.  
Published online 2008 Apr 16. doi: 10.1016/j.neuroimage.2008.04.025

PMCID: PMC2592684  
NIHMSID: NIHMS63391  
PMID: 18511305

### Functional neuroimaging correlates of finger tapping task variations: An ALE meta-analysis

Suzanne T. Witt<sup>1</sup>, M. Elizabeth Meyerand<sup>1</sup> and Angela R. Laird<sup>2</sup>

\* Author information Copyright and License information Disclaimer

### Quantitative assessment of finger tapping characteristics in mild cognitive impairment, Alzheimer's disease, and Parkinson's disease

David R. Roalf, Petra Rupert, Dawn Mechanic-Hamilton, Laura Brennan, John E. Duda, Daniel Weintraub, John Q. Trojanowski, David Wolk & Paul J. Moberg

Journal of Neurology volume 265, pages1365–1375(2018) Cite this article

935 Accesses | 16 Citations | 11 Altmetric | Metricsdetails

ELSEVIER

Cognitive Brain Research 10 (2000) 51–66

COGNITIVE  
BRAIN  
RESEARCH

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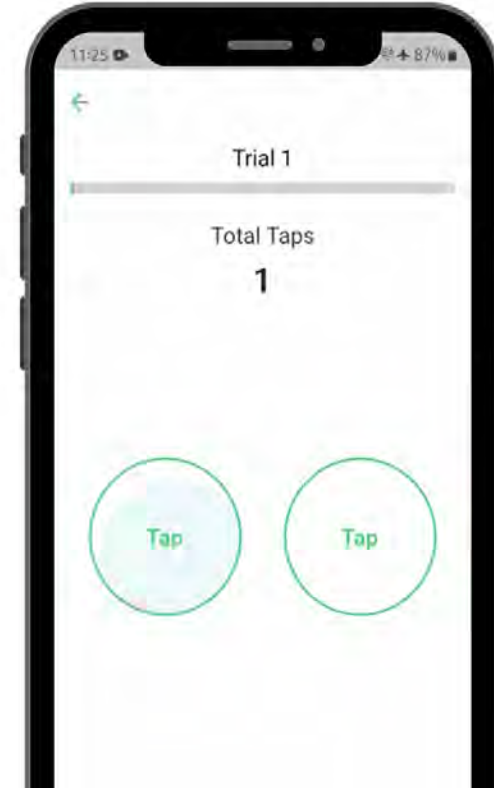
Research report

### Cortical activations during paced finger-tapping applying visual and auditory pacing stimuli

L. Jäncke<sup>a,\*</sup>, R. Loose<sup>b</sup>, K. Lutz<sup>a</sup>, K. Specht<sup>a,c</sup>, N.J. Shah<sup>c</sup>

<sup>a</sup>Department of General Psychology, Otto-von-Guericke University Magdeburg, Lennéstraße 6, D-39112 Magdeburg, Germany  
<sup>b</sup>Institute of Psychology, University of Regensburg, Regensburg, Germany  
<sup>c</sup>Institute of Medicine, Research Centre Jülich, Jülich, Germany

Accepted 21 March 2000



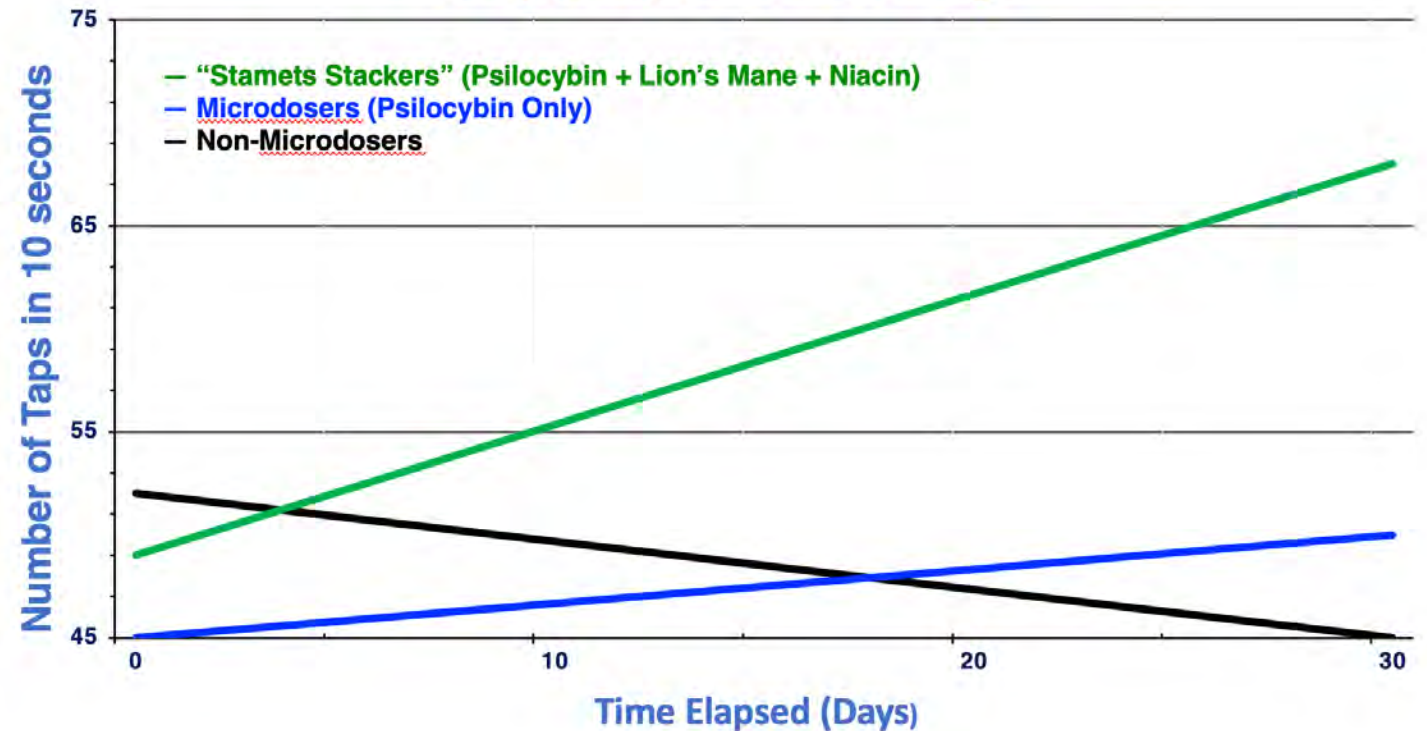
www.microdose.me

**OPEN** Psilocybin microdosers demonstrate greater observed improvements in mood and mental health at one month relative to non-microdosing controls

Joseph M. Rootman<sup>1</sup>, Maggie Kiraga<sup>2,5</sup>, Pamela Kryskow<sup>3</sup>, Kalin Harvey<sup>2</sup>, Paul Stamets<sup>4</sup>, Eesmyal Santos-Brault<sup>2</sup>, Kim P. C. Kuypers<sup>5</sup> & Zach Walsh<sup>1</sup>

Psilocybin microdosing involves repeated self-administration of mushrooms containing psilocybin at doses small enough to not impact regular functioning. Microdose practices are diverse and include combining psilocybin with substances such as lion's mane mushrooms (*Hericium erinaceus*; HE) and niacin (vitamin-B3). Public uptake of microdosing has outpaced evidence, mandating further prospective research. Using a naturalistic, observational design, we followed psilocybin microdosers ( $n=953$ ) and non-microdosing comparators ( $n=180$ ) for approximately 30 days and identified small- to medium-sized improvements in mood and mental health that were generally consistent across gender, age and presence of mental health concerns, as well as improvements in psychomotor performance that were specific to older adults. Supplementary analyses indicated that combining psilocybin with HE and B3 did not impact changes in mood and mental health. However, among older microdosers combining psilocybin, HE and B3 was associated with psychomotor improvements relative to psilocybin alone and psilocybin and HE. Our findings of mood and mental health improvements associated with psilocybin microdosing add to previous studies of psychedelic microdosing by using a comparator group and by examining the consistency of effects across age, gender, and mental health. Findings regarding the combination of psilocybin, HE and B3 are novel and highlight the need for further research to confirm and elucidate these apparent effects.

**Change in "Tap Test" Values in 1 Month for Subjects 55+ Years of Age**



$p=0.004$ . 1 chance in 250 result is random.

# Psychedelics promote plasticity by directly binding to BDNF receptor TrkB

Received: 14 October 2022

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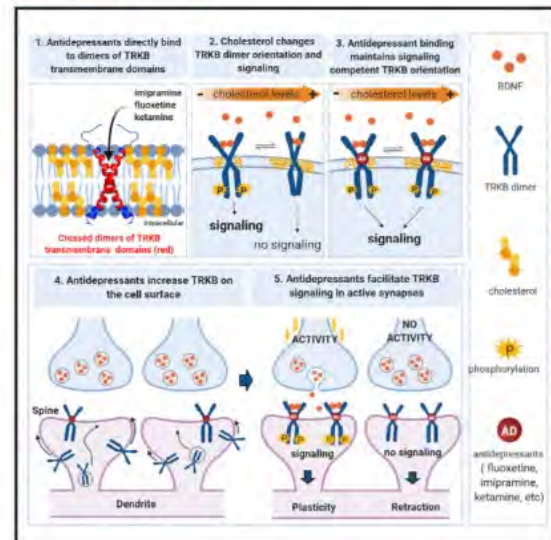
Check for updates

Rafael Moliner<sup>1,2</sup>, Mykhailo Girych<sup>3</sup>, Cecilia A. Brunello<sup>1</sup>, Vera Kovaleva<sup>4</sup>, Caroline Biojone<sup>1,5,6</sup>, Giray Enkavi<sup>3</sup>, Lina Antenucci<sup>7</sup>, Erik F. Kot<sup>8,9</sup>, Sergey A. Goncharuk<sup>8,9</sup>, Katja Kaurinkoski<sup>1</sup>, Mirjami Kuutti<sup>1</sup>, Senem M. Fred<sup>1</sup>, Lauri V. Elsilä<sup>2</sup>, Sven Sakson<sup>4</sup>, Cecilia Cannarozzo<sup>1</sup>, Cassiano R. A. F. Diniz<sup>10</sup>, Nina Seiffert<sup>1</sup>, Anna Rubiolo<sup>11</sup>, Hele Haapaniemi<sup>1</sup>, Elsa Meshi<sup>12</sup>, Elina Nagaeva<sup>2</sup>, Tiina Öhman<sup>4</sup>, Tomasz Róg<sup>3</sup>, Esko Kankuri<sup>2</sup>, Marçal Vilar<sup>13</sup>, Markku Varjosalo<sup>4</sup>, Esa R. Korpi<sup>2</sup>, Perttu Permi<sup>7,14,15</sup>, Konstantin S. Mineev<sup>8,9,16</sup>, Mart Saarma<sup>4</sup>, Ilpo Vattulainen<sup>3</sup> ✉, Plinio C. Casarotto<sup>1</sup> ✉ & Eero Castrén<sup>1</sup> ✉

Psychedelics produce fast and persistent antidepressant effects and induce neuroplasticity resembling the effects of clinically approved antidepressants. We recently reported that pharmacologically diverse antidepressants, including fluoxetine and ketamine, act by binding to TrkB, the receptor for BDNF. Here we show that lysergic acid diethylamide (LSD) and psilocin directly bind to TrkB with affinities 1,000-fold higher than those for other antidepressants, and that psychedelics and antidepressants bind

## Antidepressant drugs act by directly binding to TRKB neurotrophin receptors

## Graphical Abstract



## Authors

Plinio C. Casarotto, Mykhailo Girych, Senem M. Fred, ..., Mart Saarma, Ilpo Vattulainen, Eero Castrén

## Correspondence

eero.castrén@helsinki.fi

## In Brief

Direct binding of both typical and fast-acting antidepressants to the BDNF receptor TRKB accounts for cell biological and behavioral actions of antidepressants. This mechanism directly connects antidepressant action to neuronal plasticity and may explain the slow action of typical antidepressants.

“LSD and psilocybin directly bind to TrkB with affinities 1000 fold higher than those for other antidepressants”

# Bottom Line Theory

- Niacin (nicotinic acid) is a **catalyst** for psilocybin to activate neuro-generation via multiple receptors.
- Niacin (nicotinic acid) **aids vascular delivery** of psilocybin and related tryptamines.
- **Lower doses of psilocybin and tryptamines** may be beneficial for mental health conditions when supplemented with niacin and/or erinacines/Lions Mane.
- **Entourage effect contributes to psychomotor performance** consuming psilocybin-containing mushrooms with Lion's mane and niacin.

*Clinical trials needed to prove efficacy.*



The Aztecs taught us that consuming psilocybin mushrooms with chocolate is more palatable.

The Stamets Stack stimulates neurogenesis and neuroplasticity *in vitro*.

*Preliminary evidence demonstrates increase in psychomotor performance.*



Clinical studies planned.

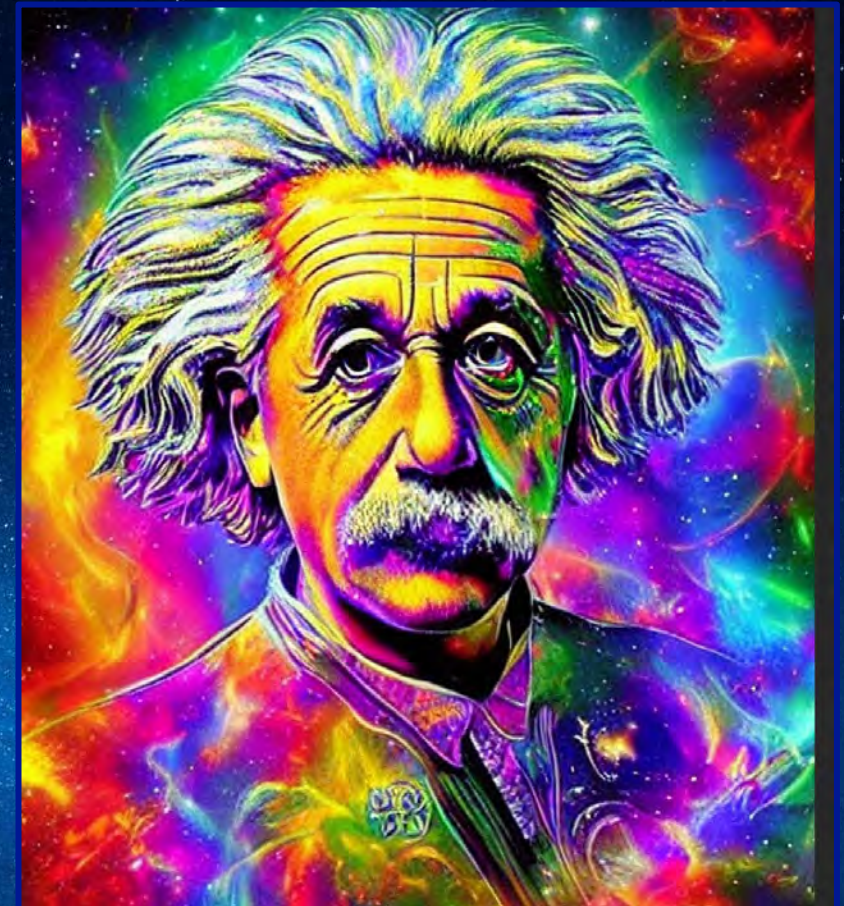


[www.mushroomreferences.com](http://www.mushroomreferences.com)

# Albert Einstein

"The intellect has little to do on the road to discovery. There comes a leap in consciousness, call it intuition or what you will, the solution comes to you and you don't know how or why."

"When you examine the lives of the most influential people who have ever walked among us, you discover one thread that winds through them all. They have been aligned first with their spiritual nature and only then with their physical selves."





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