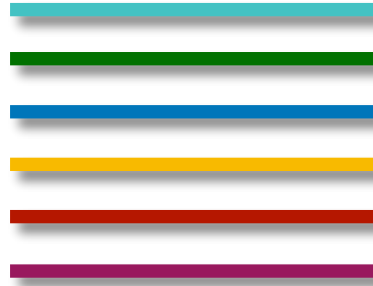
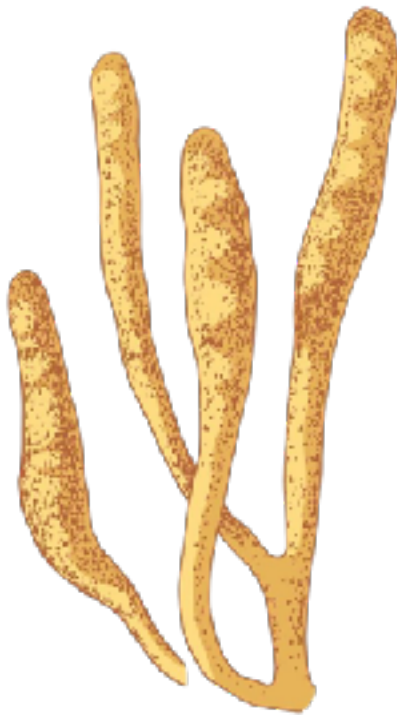


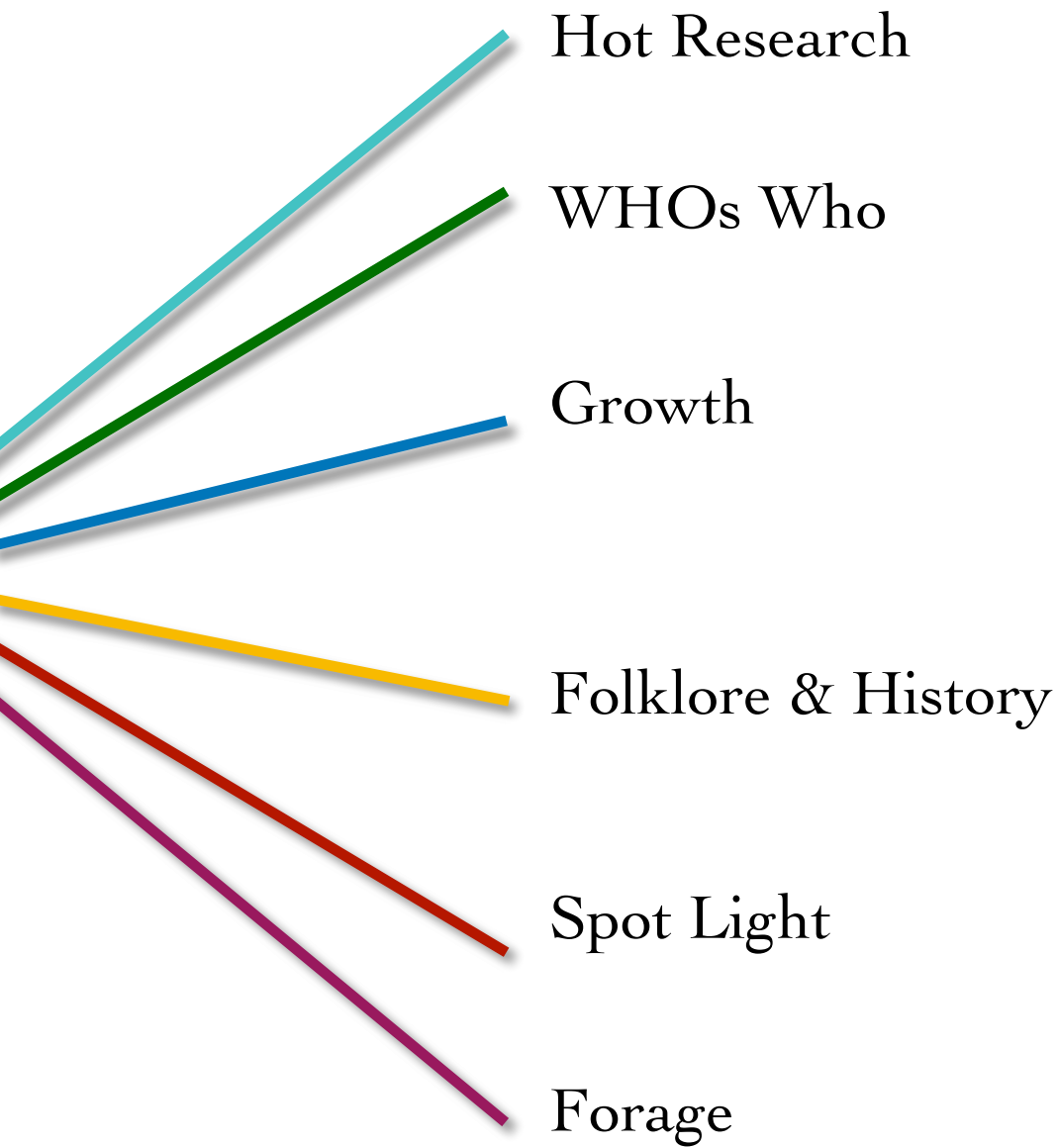
MUSHROOM

DIGEST



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Who's Who P. 14 - Alan Rockefeller

Meet our featured mycologist or mushroom entrepreneur. This month's Issue we follow along with **Alan Rockefeller**, a globally recognized mycologist who is revolutionizing the field of mycology. Known for his work in species taxonomy, stunning photography, and educational outreach, Alan is at the forefront of advancing our understanding of fungi.

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Get up to speed with our beginner's guide to understanding the fundamentals of mycology — This month, we catch up with **Dennis Walker** of *Mycopreneur* as he guides us through the etymology of mushrooms and the fascinating history behind their unique names.

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Each month, we shine a spotlight on a unique mushroom from around the world. This month, we focus on the intriguing **Cordyceps Mushroom**. Known for its eerie behavior, this mushroom takes control of insects, turning them into "zombies" to ensure its survival.

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We're excited to introduce a new section dedicated to mushroom foraging! Discover the joys and benefits of foraging, learn best practices to ensure a safe and sustainable experience, and get tips on identifying edible and medicinal mushrooms in the wild.

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Are you passionate about fungi and mycology? Do you have unique insights, research, or stories to share with our community? We are always looking for knowledgeable and enthusiastic contributors to join our team and help us create compelling content for our readers

Cover Image: Credit & photography by Alan Rockefeller: Cordyceps Tenuipes





Editors Note

Halloween Edition of Mushroom Digest

Welcome to the Halloween edition of Mushroom Digest, where we delve into the eerie and fascinating world of fungi. This month, we introduce you to the ZOMBIE mushroom, also known as Cordyceps. This parasitic fungus has a captivating survival strategy—infesting the brains of insects to take control of their behavior. But fear not; a closer look reveals that this mushroom is not something to be afraid of, but rather a fascinating organism with a unique way of living and significant potential for medical benefits.

As Editor-in-Chief, I am excited to bring together a vibrant community of mycologists, foragers, and fungi enthusiasts. Every story, photograph, and piece of research in this issue has been curated to inspire and enlighten, shedding light on the mysterious and magical world of fungi. This edition is particularly special, as it not only explores groundbreaking research but also highlights personal adventures in mycology that reveal the intricate relationships fungi have within ecosystems and our own lives.

We are also introducing some new sections that I hope will inspire you to engage with and contribute to our growing community. Whether you're fascinated by the science, the art, or the folklore of fungi, there's something here for everyone.

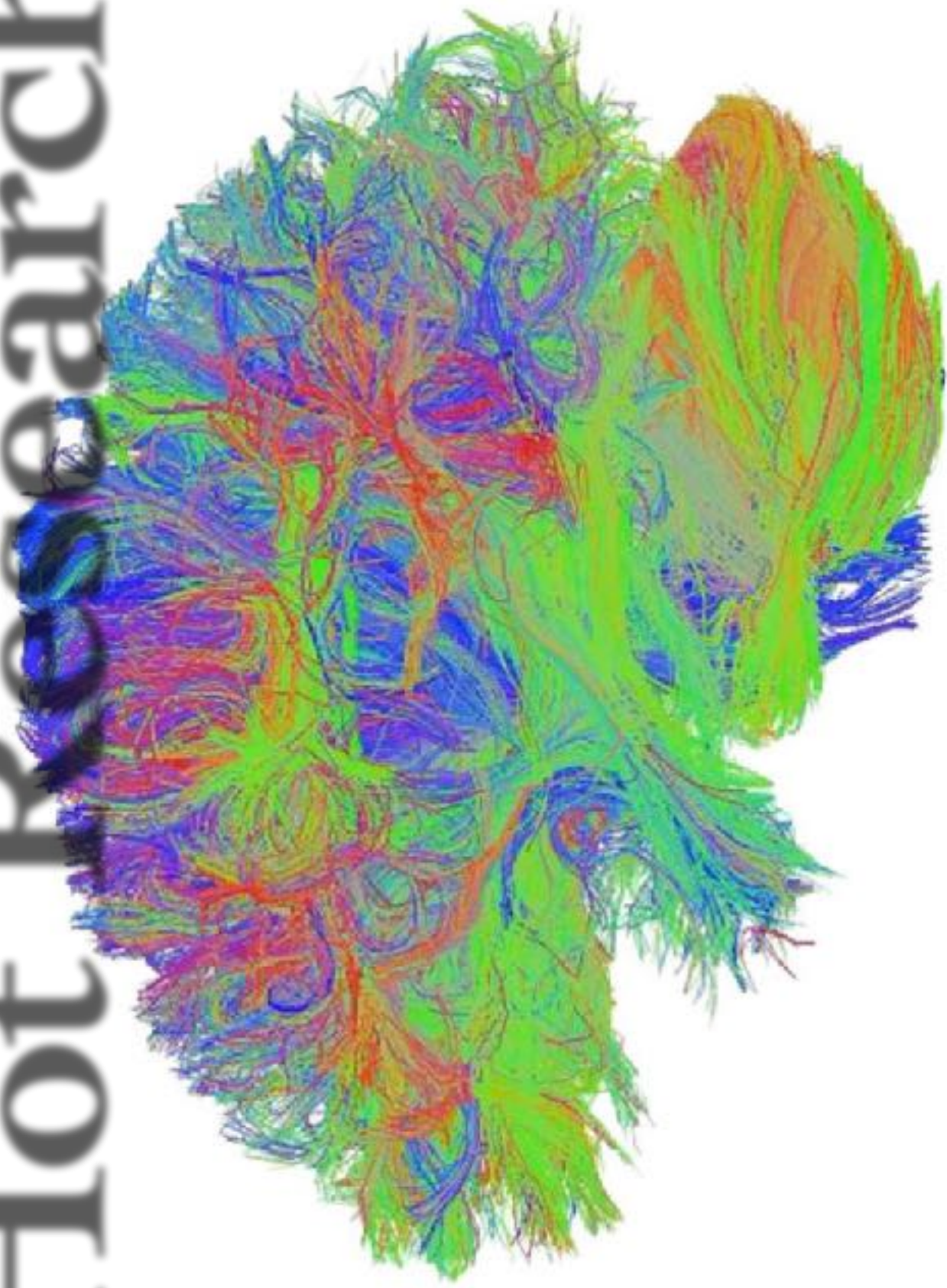
Thank you for joining us on this incredible journey. Your passion and curiosity make our exploration of mycology all the more rewarding. Together, let's uncover the profound impact and beauty that fungi bring to the world.

Warm regards,

Editor-in-Chief

Basidium Equilibrium

Hot Research



Lion's Mane: The Medicinal Mushroom Unlocking Neurogenesis

The world of fungi holds vast untapped potential, and one of the most exciting areas of study is the medicinal use of the Lion's Mane mushroom (*Hericium erinaceus*). Renowned for its brain-boosting properties, Lion's Mane has become a focus for researchers exploring natural remedies for cognitive enhancement and neuroprotection.



Meet Hirokazu Kawagishi, a renowned Japanese scientist with over 35 years of experience in fungal chemistry. Specializing in natural biochemistry, Kawagishi has honed his expertise in isolating the molecular mechanisms of bioactive compounds. His groundbreaking work has led to the discovery of more than 120 bioactive compounds sourced from various fungi. One of his most notable achievements includes his research on Lion's Mane (known in Japanese as "Yamabushi-take," meaning "Mountain Priest Mushroom"). His exploration of this mushroom has uncovered its potential in promoting neurogenesis and supporting cognitive health, making him a pioneering figure in the field of medicinal mycology. He

uncovered Lion's Mane's ability to stimulate neurogenesis, the process of creating new neurons in the brain. This discovery opened new avenues for potential treatments targeting neurodegenerative diseases and age-related cognitive decline.

These compounds were found to stimulate the production of Nerve Growth Factor (NGF), a protein essential for the growth, maintenance, and survival of neurons. This discovery was particularly significant as NGF is typically too large to cross the blood-brain barrier when synthesized externally. However, the natural compounds in Lion's Mane demonstrated an ability to cross this barrier, allowing them to directly promote nerve regeneration in the brain.

Research indicates that the compounds found in Lion's Mane not only stimulate NGF but also increase levels of Brain-Derived Neurotrophic Factor (BDNF), another critical protein for brain health. NGF and BDNF support the growth, repair, and maintenance of neurons, making them crucial for neuroplasticity—the brain's capacity to adapt and form new connections

throughout life. By boosting these proteins, Lion's Mane could protect against Alzheimer's, Parkinson's, and other neurodegenerative diseases, while also enhancing memory and cognitive functions.

Animal studies have shown that mice administered with Lion's Mane extract exhibited improved cognitive performance, including better spatial and short-term memory. These results are promising as they suggest Lion's Mane may help restore and protect cognitive function in humans.

While most studies on Lion's Mane's effects have been conducted on animals, the findings are encouraging. Human clinical trials are also beginning to show positive outcomes. For example, a double-blind, placebo-controlled study on older adults with mild cognitive impairment demonstrated significant improvements in cognitive function after consuming Lion's Mane powder for 16 weeks. These results suggest Lion's Mane could be beneficial not only for preventing age-related cognitive decline but also for promoting overall brain health.

As neurodegenerative diseases become more prevalent, natural solutions like Lion's Mane offer hope for developing new, non-invasive treatments. Ongoing research continues to explore its anti-inflammatory properties, which may help reduce chronic inflammation in the brain—a factor associated with Alzheimer's and other cognitive disorders.

If you're interested in the potential benefits of Lion's Mane, it is available in various forms, such as capsules, powders, and extracts. Incorporating Lion's Mane into your daily routine—by adding it to smoothies or tea—may offer cognitive support. However, it's advisable to consult with a healthcare provider before using Lion's Mane, especially for those with medical conditions or those on medication.

The pioneering research of Dr. Kawagishi and subsequent studies by scientists worldwide show that Lion's Mane is more than just a culinary mushroom—it's a potential powerhouse for brain health. As research continues to explore its effects on neurogenesis and cognitive function, Lion's Mane stands as a promising natural remedy that could play a pivotal role in the future of medicinal fungi.

With its ability to promote neurogenesis, enhance memory, and support cognitive health, Lion's Mane may revolutionize the treatment of neurodegenerative diseases and cognitive decline. From the forest floor to the laboratory, this mushroom's journey highlights the incredible power fungi hold in the world of medicine.

We commend Dr. Kawagishi for his dedication to his study and his discoveries.





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WHO'S ON TV



Alan Rockefeller: Pioneering Mycologist in Fungal Taxonomy & Education

Alan Rockefeller is a name that resonates across the field of mycology. Specializing in fungal taxonomy, genetic DNA barcoding, photography, and education, Alan has dedicated his career to unraveling the mysteries of fungi. Known for his hands-on approach, you'll often find him participating in local mushroom festivals and fungal forays hosted by mycological societies across the United States. Despite his busy schedule and constant travel, Alan remains one of the most approachable and down-to-earth figures in the community, always ready to share his knowledge and passion with others.



Alan's expertise in fungal taxonomy and genetic DNA barcoding has made him an invaluable resource in identifying and cataloging fungi species, particularly within the *Psilocybe* genus. Specializing in psychoactive mushrooms, Alan has significantly contributed to the discovery and documentation of new species, expanding our understanding of this intriguing group. By isolating and analyzing genetic sequences, Alan's work has provided deeper insight into fungal biodiversity and the evolutionary relationships within *Psilocybe*.

His approach combines traditional taxonomy; examining morphological features with cutting-edge molecular techniques like genetic DNA barcoding.

This dual methodology helps bridge the gap between field observations and genetic research, ensuring that each identified species is accurately cataloged. Alan's focus on Psilocybe mushrooms has also led to the identification of several new species, as he continuously explores global habitats known for their fungal diversity.

One of the key platforms Alan collaborates with is **Entheome.org**, an organization dedicated to the genetic sequencing of fungi and other organisms, with a special focus on psychoactive species like Psilocybe. His work with Entheome.org has been instrumental in ensuring that detailed genetic data on these mushrooms is accessible to the broader scientific community. This collaboration allows for the precise cataloging of Psilocybe species, providing mycologists and researchers worldwide with crucial information on their genetics, ecological roles, and medicinal potential.

Through his combined efforts in taxonomy, fieldwork, and molecular biology, Alan Rockefeller continues to lead the way in the study and documentation of Psilocybe mushrooms, helping demystify a genus with significant cultural, ecological, and medicinal importance.



Image: Psilocybe Gandolfini

Alan is not just a researcher; he is also a passionate educator and photographer. His educational efforts extend beyond formal settings, as he frequently collaborates with various mycological groups, both online and in-person. On Facebook, Alan is an active participant in numerous mushroom identification groups, assisting users in identifying fungi through his extensive knowledge and his eye for detail.

Through his photography, Alan captures the beauty and intricacies of fungi, bringing their fascinating world to life. His images serve as both educational tools and art, showcasing the diverse morphology and vibrant colors of mushrooms from around the globe. These photographs are not only shared on social media but also displayed at mycological events, further solidifying his role as an ambassador for fungi.



Image: Genus Cordyceps

Alan's commitment to education and community involvement is evident in his collaboration with organizations like the **North American Mycological Association (NAMA)** and his participation in numerous fungal forays. These events provide a platform for Alan to connect with other mycologists, enthusiasts, and nature lovers, fostering a collective appreciation and understanding of fungi.

He is also an active contributor to **iNaturalist**, a global platform that helps identify and catalog organisms in nature. With over 29,000 observations and 300,000 identifications, Alan has significantly contributed to the identification of fungi worldwide. His presence on the platform not only assists other users but also builds a comprehensive database that enhances the study of mycology and supports biodiversity conservation efforts.

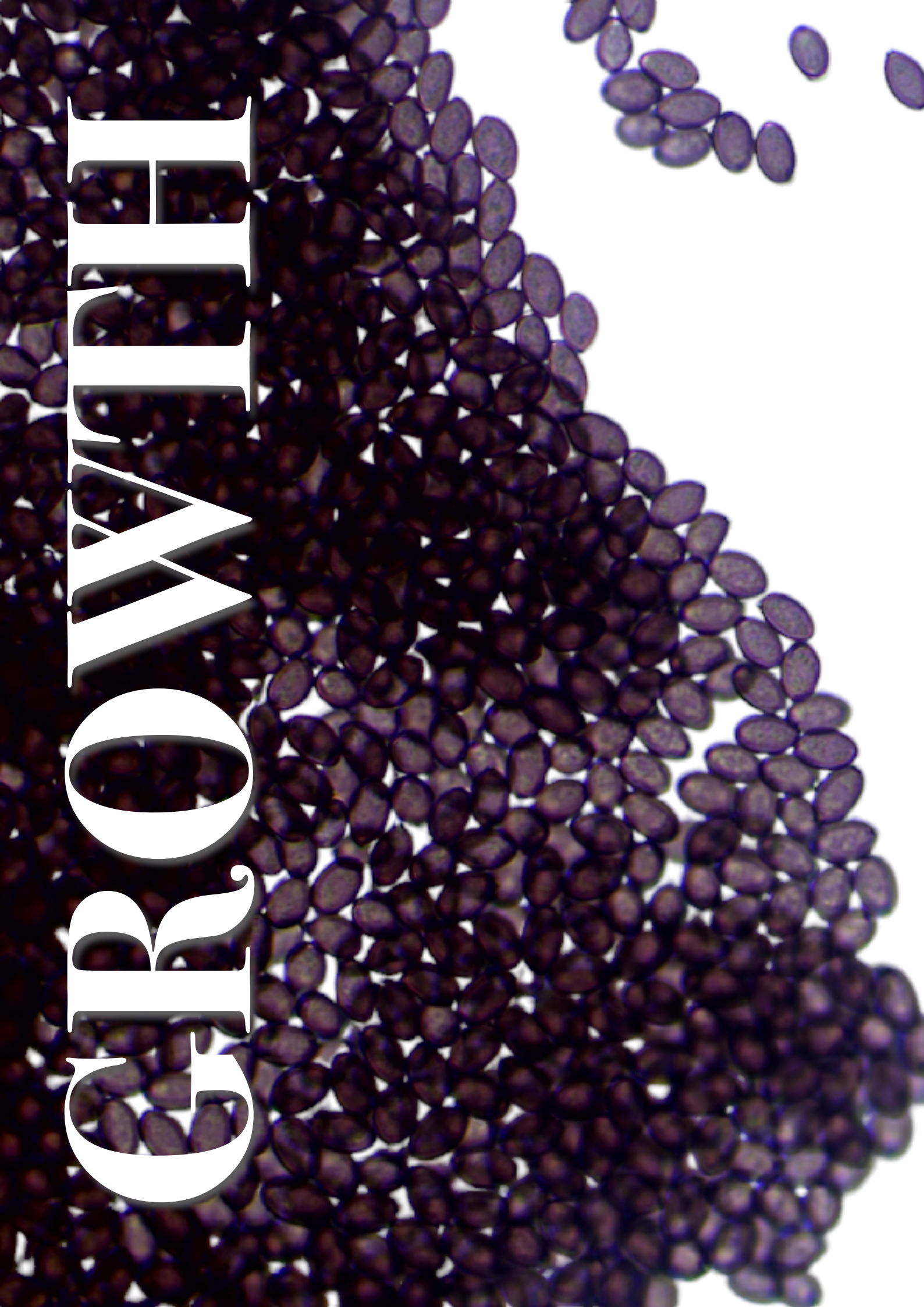
Despite his extensive involvement and the demands of his work, Alan remains a friendly and accessible figure in the mycology community. The few opportunities I've had to sit down and catch up with him reveal just how grounded and approachable he truly is. Alan's commitment to his craft and the people around him showcases his passion for fungi and education.



Alan Rockefeller's work has already had a tremendous impact on the field of mycology. His expertise in taxonomy, genetic sequencing, photography, and education makes him an irreplaceable figure in advancing our understanding of fungi. Whether it's through his collaborations with platforms like iNaturalist, Entheome.org, and NAMA, or his hands-on participation at local events and online communities, Alan continues to inspire and educate the next generation of mycologists and mushroom enthusiasts.

In a field that is as diverse and ever-evolving as mycology, Alan Rockefeller stands out as a true pioneer, tirelessly exploring the fungal kingdom and sharing his discoveries with the world.





GRAND
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Spore Inoculation Technique

Whether you are new or experienced to mushroom cultivation, you will inevitably have to use spores in a lab process to grow your mushroom species out successfully. Now more than ever there are so many options to cultivation or cutting corners in your cultivation process. For the intrinsically curious mind, the cultivation of your spores is a rewarding hands-on experience.

We will cover the basic necessities of spore inoculation and some visual aids to help you along this process and understand what you can expect from your own attempted work.

Everything you will need

- Sterile Petri dishes with agar (pre-poured nutrient-rich medium, e.g., Malt Extract Agar or Potato Dextrose Agar)
- Spore syringe with sterile needle, Spore Print or Spore swab
- Flame source (alcohol lamp or butane torch)
- Scalpel or inoculation loop
- Alcohol (70% isopropyl) for disinfecting
- Sterile gloves and a sterile workspace (glove box, still air box, or HEPA-filtered clean area)

Procedure:

1. Prepare Your Sterile Workspace:

- Set up a still air box or work inside a glove box to minimize contamination. Ensure the space is thoroughly cleaned with 70% isopropyl alcohol.
- Wear sterile gloves and disinfect them with alcohol. Use a face mask if possible to reduce contamination from breathing.

2. Sterilize Tools:

- If using a spore syringe, flame sterilize the needle until it glows red using the alcohol lamp or butane torch. Allow it to cool for a few seconds (do not touch or blow on it).
- If using a scalpel or inoculation loop for transferring spores, flame sterilize it similarly and let it cool before use.

3. Open the Petri Dish Carefully:

- Open the lid of the petri dish slightly, just enough to insert the needle or inoculation tool. Avoid exposing the agar to open air for too long to prevent contamination.

4. Inoculate the Agar:

- For a Spore Syringe:
 - Inject a single drop of the spore solution onto the center of the agar plate. Be careful not to flood the plate—only a small amount is needed.
- For a Spore Swab:
 - Lightly streak the swab across the surface of the agar in a zigzag pattern. Rotate the swab as you streak to deposit spores evenly.
- For spore prints - Take a clean spore print and get it unwrapped. Take a sterile swab or scalpel blade and scrap off some spores directly to your Agar petri dish. This is probably one of the most straight forward ways to inoculate spores. Although this can be more timely.



5. Close and Seal the Petri Dish:

- Immediately close the petri dish after inoculation. Use micropore tape or parafilm to seal the edges, ensuring minimal air exchange while still preventing contamination.

6. Label the Dish:

- Write the date, strain name (if known), and any other relevant details on the side of the petri dish for tracking purposes.

7. Incubate the Agar Plate:

- Place the inoculated plates in a clean and warm environment (around 75-80°F or 24-27°C). Avoid direct light exposure.
- Ensure the temperature remains stable using a thermometer and, if needed, a heating pad or incubator.

8. Monitor the Growth:

- Check the plates after 3-5 days for signs of germination. Mycelium should begin to appear as white, fuzzy growth from the spore droplet or streaks.
- Look for any signs of contamination (green, black, or other colored growth) and discard contaminated plates.
- Spores can take wide ranges of time to germinate depending on the species and age of the spores. Spore can become dry and need extra time to hydrate on the petri dishes. I would recommend patience when working with spores, I have observed spores taking as long as months to germinate and be have healthy growth.

9. Isolate Clean Mycelium (If Needed):

- Once the mycelium starts growing, you may need to transfer a clean section of mycelium to a new agar plate to ensure a pure culture. Sterilize your scalpel, cut a small piece of uncontaminated mycelium, and transfer it to a fresh plate using the same sterile technique. It is not uncommon to experience contamination of some kind when working with spores. If this is the case, a transfer is absolutely necessary. But this should not be something intimidating as it is part of the process and can be fun.

By following these steps, you can successfully inoculate agar petri dishes with mushroom spores, promoting the growth of mycelium under controlled conditions. This process forms the foundation for further steps in mushroom cultivation, such as isolating specific strains or transferring mycelium to grain spawn for larger-scale production.

Happy growing

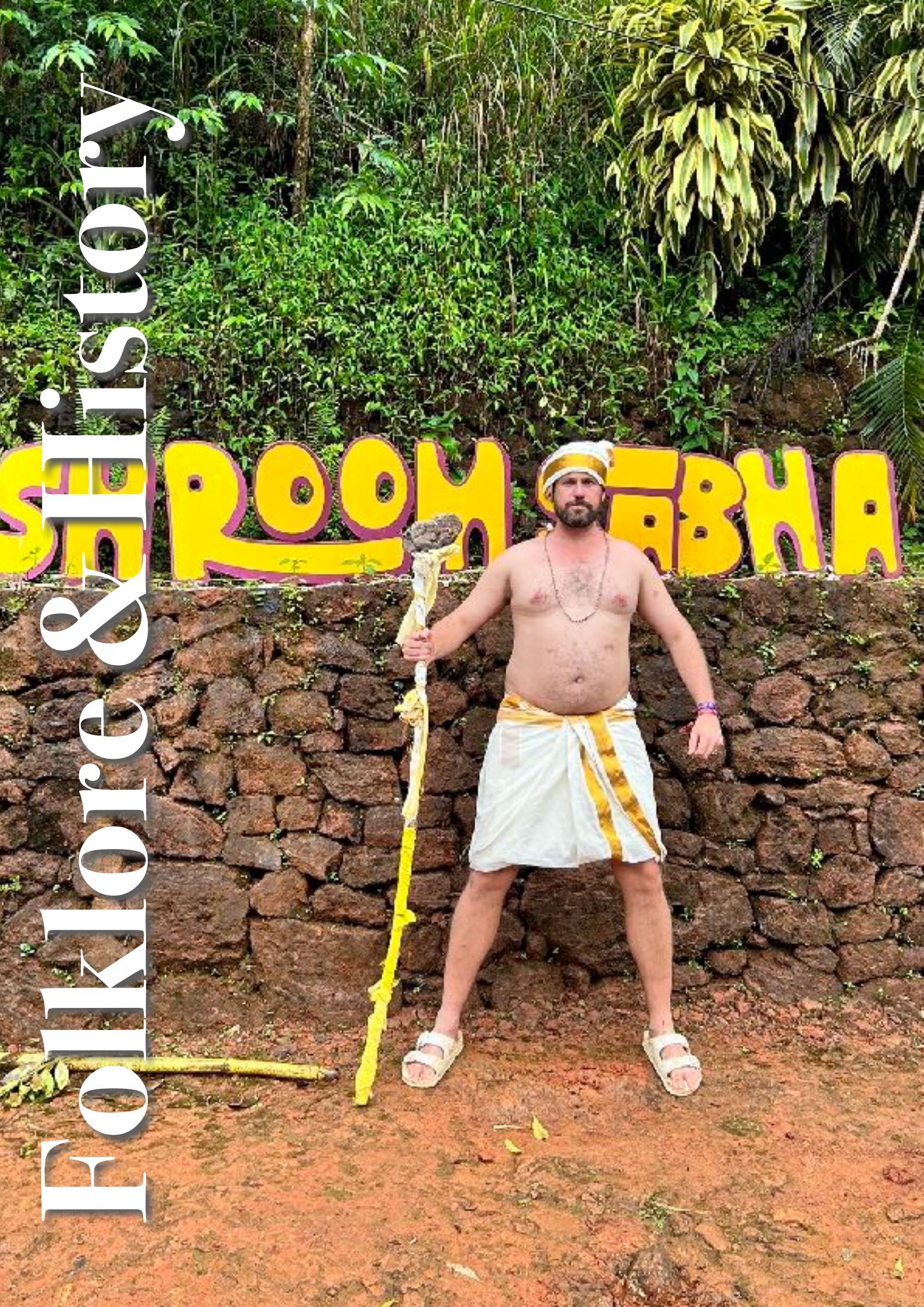






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Folklore & History



Mycoetymology: What's In a Mushroom Name?

Folk traditions underpinning the etymology of various mushroom names across different cultures reveal a tremendous amount about the importance of fungi to different peoples historically.

For example, the fabled red and white Amanita muscaria mushroom - immortalized with its own emoji in the digital era (🍄) - has different names across cultures that all point to its mysterious and enchanting properties.

In Japan, the traditional name for Amanita muscaria is 'Beni-tengu-take'. The suffix 'take' should come as no surprise here; consider that Shiitake and Matsutake are also Japanese names for two popular global mushrooms, and the word 'take' itself means mushroom in Japanese.

Image: Amanita Muscaria



What makes the name 'Beni-tengu-take' for Amanita muscaria particularly interesting is that 'Tengu' are a type of mythical being in the Shinto spiritual belief system. Tengu even have their own emoji (👹) - this trickster archetype in Japanese mythology bestowed various gifts and knowledge upon humanity, including swordsmanship and martial arts. The naming of the Amanita muscaria mushroom after the Tengu spirits ascribes a sense of metaphysical power to the enigmatic mushroom, suggesting that its magical properties have long been known in Japanese culture.

In the former soviet republic of Georgia, the Amanita muscaria is reportedly traditionally known as 'Mushroom That Takes You to the Sky' - another

etymological insight into the historical value and recognition of the mushroom across cultures. For a world class deep dive into the ethnomycology of *Amanita muscaria*, including additional insights into its mythologization and naming across ancient cultures, check out Merry Mushroom 3-part lecture series online course by Ash Ritter of Black Sage Botanicals.

Another member of the *Amanita* genus can trace its name to royalty - *Amanita caesarea* was a favorite mushroom of the rulers of the Roman Empire, a convenient foil for the assassination of Claudius Caesar in 54 AD by mushroom poisoning when his beloved *al funghi* dish was crowned with a toxic *Amanita phalloides* ("Death Cap mushroom") in a successful bid for alternate succession. 5 hours after eating his favorite 'Amanita caesarea' dish, Claudius became intensely ill and succumbed to death by mushroom poisoning, clearing the way for his fourth wife Agrippina's son Nero to ascend to the throne.

In China, the life affirming properties of the Reishi mushroom are packaged into the ancient name for this shelf fungus - 'Lingzhi', a signifier which translates to 'mushroom of immortality'. The Lingzhi mushroom was so prized for its adaptogenic and immunity boosting qualities that its use was reserved exclusively for nobility, and any commoner found to be in possession of this mushroom was punished rather severely.

In Pre-Columbian Mesoamerica, Psilocybin containing mushrooms were referred to as 'Teonanacatl' in the Nahuatl language, meaning 'Flesh of the Gods'. It's well documented that these mushrooms were important to the Olmecs, Maya, and Nahuatl and used for millennia in sacrosanct ceremonies across the greater region.



Image: Dennis Walker; holding *Macrocybe titans*

The Maitake ('hen of the woods') mushroom in Japanese is known as the 'dancing mushroom' due to the happy dance that foragers would

spontaneously break into upon finding the fungus. The tradition of fungi use in Japan is estimated to be at least 4,000 years old according to the excavation of various ceramic mushrooms from various archaeological sites across the archipelago.

In Barbados, the metaphysical nature of mushrooms is consecrated culturally by the local parlance 'Duppy Umbrella', meaning 'ghost umbrella'. The influence of African spiritual tomes co-opted into Christian associations of witchcraft and the devil inform a mycophobic culture that historically views mushrooms as belonging to the world of ghosts and demons. This same framing can be traced to European cultures as well, with the Fribourg dialect in Switzerland labeling *Amanita muscaria* as 'Diablhou', translating to 'Devil's hat'. The association between fungi and magic / witchcraft is also readily found in the colloquial name 'Witches Butter' for *Tremella mesenterica* - also known as 'jelly fungus' for its gelatinous constitution.



Image: *Tremella mesenterica* "Witches Butter"

There are an estimated 7,100 different languages still spoken around the world today, over 40% of which are at risk of extinction due to ecosystem and cultural erosion of indigenous habitats around the world. With the widespread recognition of mushrooms across geographically distant and climatically diverse regions, it's likely that many kernels of folk wisdom and clues about the history of our species are still embedded in the naming of mushrooms and their use among any particular culture and society throughout history. Otzi "The Ice Man" even had two separate polypore mushrooms on him when he perished in an alpine glacier in the Tyrolean alps from a suspected arrow wound over 5,000 years ago - they were important enough to him to be carried in separate leather satchels, indicating their value to the ancient culture from which he came. What did Otzi and his tribe call these mushrooms?

The appearance of mushrooms across folk traditions around the world is something that requires urgent preservation and study as more and more cultures coalesce into the homogenizing force of globalization. If the above references are any indication, there are surely numerous as yet undocumented or indexed indigenous names for different mushrooms across the thousands of different cultures and tribes which have a historical relationship with fungi. The etymology of mushrooms in different cultures reflects their form and function across ancient societies, and a glossary of indigenous and folk names for various fungi could very well help us to further document and understand the important role that the mushroom kingdom has played in shaping human cultures and civilizations across history.



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The Spooky World of Cordyceps: Fungi That Take Control

Cordyceps mushrooms are some of the most fascinating and eerie fungi in the natural world. Known for their ability to infect and control the behavior of insects, these parasitic mushrooms have evolved a survival strategy that reads like a horror story. Once they invade the host insect's body, Cordyceps can take over its central nervous system, manipulating its behavior to ensure the fungus can grow, fruit, and spread its spores. Despite their terrifying nature, these mushrooms also hold incredible potential for human health, particularly species like *Cordyceps sinensis* & *Cordyceps militaris*, which have been used in traditional Chinese medicine for centuries.

The Cordyceps genus comprises over 400 species, each with a specific host range, including ants, caterpillars, and other insects. The most famous example is *Ophiocordyceps unilateralis*, often referred to as the "zombie-ant fungus." This species infects ants, taking control of their behavior and compelling them to climb vegetation before attaching themselves with their mandibles. The fungus then kills the host and grows a fruit body that emerges from the insect's body, releasing spores into the environment to infect more ants.



Image: Ophiocordyceps unilateralis; growing out of an Ant

Other species, such as *Cordyceps militaris*, infect moth caterpillars and display similar behavior, growing fruiting bodies directly out of the insect's remains. These fungi are masters of manipulation, ensuring their lifecycle continues by turning their hosts into zombie-like carriers that unknowingly spread the spores to new areas.

Cordyceps mushrooms are not just a spooky phenomenon; they have been valued for centuries in Traditional Chinese Medicine. The most well-known medicinal species are *Cordyceps sinensis* and *Cordyceps militaris*. These fungi have been traditionally used to enhance energy, stamina, and vitality. In ancient China, *Cordyceps* was reserved for the emperor and his family due to its scarcity and perceived health benefits.

Modern research supports many of the traditional uses of *Cordyceps militaris* & *Cordyceps sinensis*. This mushroom contains bioactive compounds such as cordycepin, which has shown anti-inflammatory, antioxidant, and anti-aging properties. Additionally, *Cordyceps militaris* acts as a natural vasodilator, improving blood flow and oxygenation. This makes it a popular supplement for enhancing athletic performance and energy levels.

Compounds in *Cordyceps* have been shown to increase ATP production, the body's primary energy molecule. This can lead to improved endurance, making it a popular choice for athletes and those looking for a natural energy boost. The mushroom's ability to relax and widen blood vessels not only enhances circulation but also supports cardiovascular health, making it an effective natural treatment for improving overall blood flow.

Immune System Support: Studies indicate that *Cordyceps militaris* may stimulate the immune system, helping the body defend against infections and illnesses. It is often used as a supplement for general wellness and immunity boosting.



Image: Cordyceps sinensis

Ophiocordyceps sinensis: Also known as the "caterpillar fungus," this species infects caterpillars of ghost moths. It has been traditionally used in Chinese medicine to treat fatigue, kidney disease, and low libido. Due to its high demand and rarity, it is one of the most expensive mushrooms in the world. Pricing is very high for this mushroom because of the difficulty in cultivation; and reliance on wild foraged. Prices can be as high as 10 thousand dollars per pound.

Cordyceps australis; this species targets weevils and other beetles. While not as commonly used for medicinal purposes, it showcases the diversity and adaptability of the *Cordyceps* genus.



Image: Cordyceps Militaris - Photography by Keaton Lions

Scientific studies are increasingly validating the health benefits of *Cordyceps* mushrooms. Research into their potential effects on cardiovascular health, energy production, and immune response continues to grow, with *Cordyceps militaris* at the forefront. It is becoming an essential ingredient in functional foods and supplements, bridging the gap between ancient traditions and modern health practices.

While their insect-controlling abilities may seem like something from a horror film, Cordyceps mushrooms represent the complexity and adaptability of nature. They highlight the intricate relationships within ecosystems, where fungi and insects are engaged in a continuous evolutionary dance. But beyond their spooky life cycle, these fungi also offer significant medicinal value, showcasing their potential in enhancing human health and well-being.

As we explore more about Cordyceps in both traditional medicine and modern science, we begin to see that these fungi, while eerie in nature, are powerful allies in our quest for better health.

Cordyceps mushrooms are a perfect blend of the mysterious and the medicinal. Their ability to manipulate the behavior of insects is a fascinating example of nature's complexity, while their potential benefits in human health continue to inspire scientific research.



Cover Image: Cordyceps Tenuipes: photography by Alan Rockefeller



Image: Cordyceps Militaris; Credit - Keaton Lions



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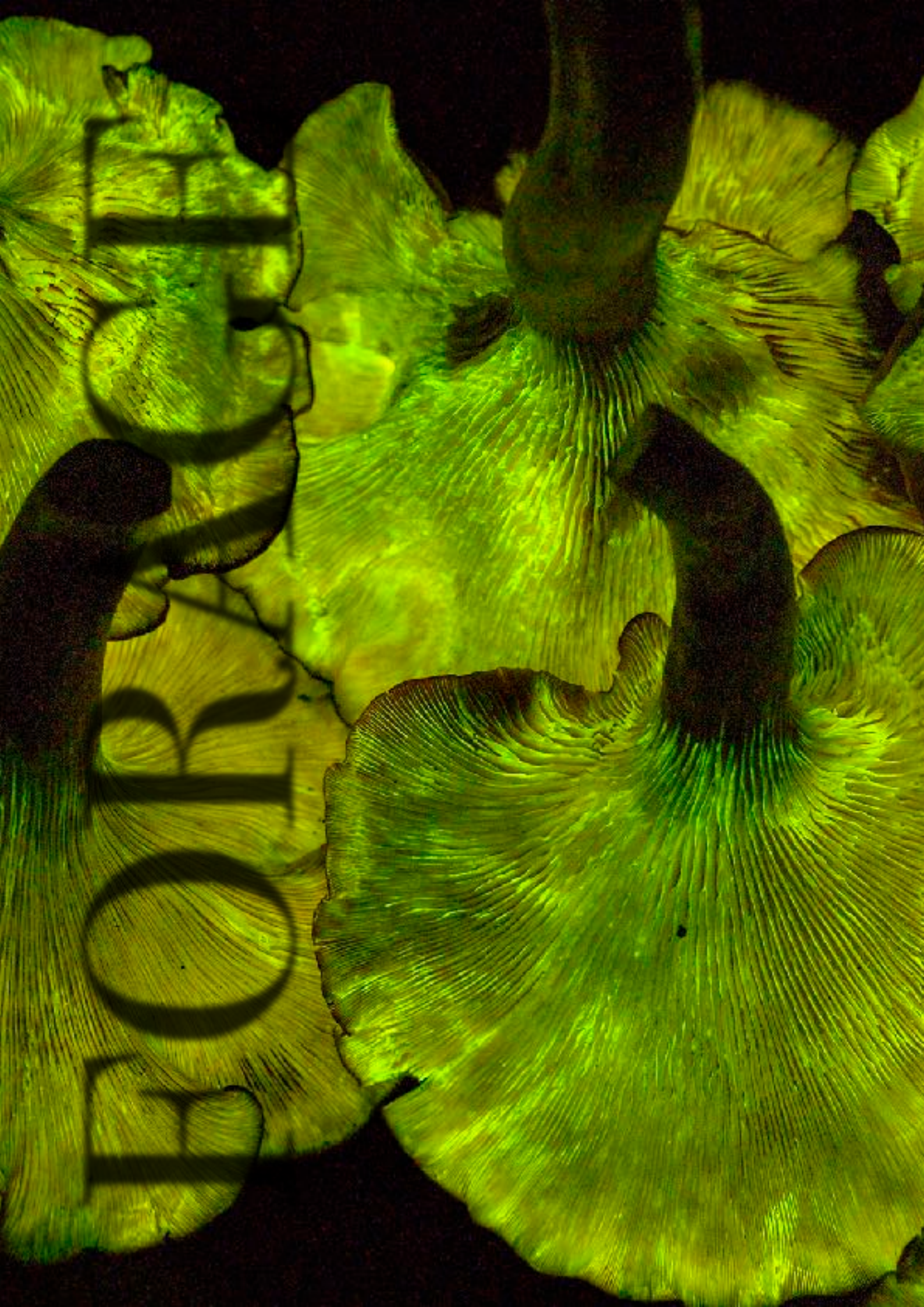
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Eastern Jack-o'-Lantern Mushroom - *Omphalotus illudens*

Welcome to the spooky October edition of *FORAGE* in Mushroom Digest! This month, we step into the mysterious world of the *Eastern Jack-o'-Lantern Mushroom* - *Omphalotus illudens*. With its bioluminescent glow, golden hues, and impressive size, this mushroom is a thrilling find for fall foragers. While it's not edible—in fact, it's toxic—its presence in the autumn woods is a true spectacle, especially under the veil of night when it reveals its fairy-tale-like glow.



Identification Guide: How to Find *Omphalotus illudens*

While we typically focus on foraging for edible mushrooms, *Omphalotus illudens* is a must-know species, particularly for those who enjoy the hunt for lookalikes like **chanterelles**. These glowing beauties often appear in the fall and are commonly found in **clusters** at the base of decaying hardwood trees, particularly oaks and beech.

- **Color:** *Omphalotus illudens* sports a bright orange to yellow cap, similar to chanterelles but with a slightly darker and more vibrant tone.
- **Size:** They grow in clusters, and their caps can reach up to 8 inches in diameter, giving them a striking appearance.
- **Gills:** Unlike chanterelles, which have blunt, false gills or folds, *Omphalotus illudens* has true, deeply notched gills that run down the stem. The gills are close together and prominent—one of the most distinguishable features when trying to differentiate between the two species.

- **Growth Habit:** This species grows in large clusters or tufts, often found at the base of hardwood trees or stumps. Chanterelles, on the other hand, typically grow singly or in small groups and are more spread out on the forest floor.
- **Bioluminescence:** One of the most enchanting features of *Omphalotus illudens* is its ability to glow in the dark. In complete darkness, the gills emit a faint greenish glow due to the presence of luciferase, an enzyme that causes bioluminescence. To see the effect, gather some of the mushrooms and observe them in total darkness—it's a magical experience straight out of a storybook!

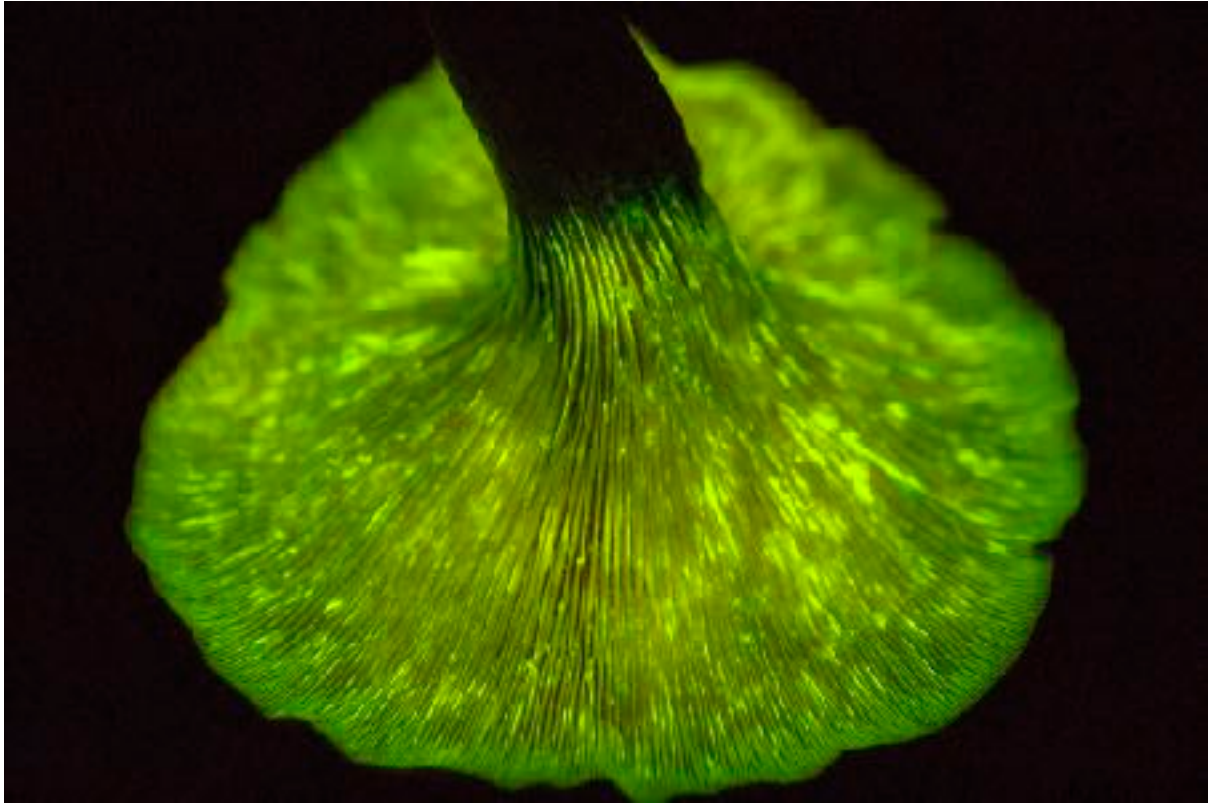


Image: Alexey Sergeyev 2008

While these mushrooms are visually captivating, they are not safe to consume. *Omphalotus illudens* is toxic, causing severe gastrointestinal distress if ingested. Symptoms can include nausea, vomiting, and cramps, typically appearing several hours after consumption. It's crucial for foragers to be aware of this species, especially since its resemblance to chanterelles may lead to confusion among less experienced mushroom hunters.

Since *Omphalotus illudens* and chanterelles share a similar golden color and appear in the same habitats, it's important to know how to tell them apart:

Remember, chanterelles tend to grow singly or in scattered groups, while *Omphalotus illudens* often forms dense, overlapping clusters.

Gills vs. Folds: Chanterelles have false gills that look more like wrinkles or folds, whereas the Jack-o'-lantern's gills are true and distinct, running straight down the stem.

Habitat Clue: While both mushrooms favor hardwoods, Jack-o'-lantern mushrooms grow directly at the base or on stumps of trees, while chanterelles typically appear on the forest floor, often around the roots of trees but not directly attached.

The Jack-o'-lantern mushroom gets its name not just from its glowing gills, but from its resemblance to the fiery orange pumpkins associated with Halloween. The bioluminescence has inspired folklore and tales of eerie, glowing forests, captivating those who wander the woods at night. This glow, while faint, adds an ethereal quality to the forest, making it a mushroom that foragers are excited to find—despite its inedible nature.

While the Eastern Jack-o'-lantern is primarily known for its bioluminescence and toxicity, research into the genus *Omphalotus* has shown that some species contain compounds with potential medicinal properties. While *Omphalotus illudens* itself is not recommended for consumption, ongoing studies explore the potential of its chemical compounds for their antifungal and antimicrobial properties, similar to the way many other non-edible mushrooms are being investigated for health benefits.

Even though *Omphalotus illudens* isn't for the dinner table, its enchanting bioluminescence and striking appearance make it a worthy addition to any forager's knowledge. If you come across these glowing beauties this fall, take a moment to appreciate their magic—just be sure to leave them where they grow.

This Halloween season, let's embrace the spooky side of fungi and marvel at the wonders of nature's glow. For more tips and guides on mushroom identification, keep exploring FORAGE in Mushroom Digest. Happy hunting, and remember—stay curious, stay safe, and enjoy the thrill of the hunt!





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