

**Minutes PAB-Products Sub-committee meeting**  
held 10 May 2021 11-1PM

**I. Introductions and attendance**

- Jessie Uehling x
- Mason Marks absent
- Rachel Knox x
- Steph Barss x
- Angie Carter x
- David Hart x

**II. Housekeeping**

The minutes from 27 June 2021 were unanimously approved.  
Jessie Uehling highlighted the upcoming speakers series:

<b>June 10th</b>	Paul Stamets
<b>June 24<sup>th</sup></b>	Felix Blei
<b>July 8<sup>th</sup></b>	Daniel Ballhorn & Kyle Meyers
<b>July 22<sup>nd</sup></b>	James Keim
<b>August 5<sup>th</sup></b>	Keith Williams
<b>August 19<sup>th</sup></b>	Benjamin Malcolm

Jessie Uehling clarified the following points:

- 1. sale and tax** – sales refer to service center – client interactions and psilocybin products can be billed and taxed separately.
- 2. non-mushroom-based products** – psilocybin products besides mushrooms may be regulated uniquely e.g. not as crops covered by ORS 215.203
- 3. tracking system** - The OHA can develop its own tracking system if it likes, which presumably it will do if the OLCC's METRC system is deemed unfit.

**III. Paul Stamets presentation**

Paul gave an overview of Oregon based history of psychedelic research on psilocybin producing fungi.

He gave presented fungal biology insights, noting that mushrooms are one of many complex tissues in the fungal life cycle.

He underscored the importance of considering fungal allergies in screening and facilities design, as many people are allergic to fungal spores.

He noted that the most widely distributed and cultivated species of *Psilocybe* is *P. cubensis*, a dung adapted fungus which can be easily and safely cultivated on grain substrates.

He noted that several species including *P. azurescens*, *P. alennii*, *P. ovoideocystidiata*, and *P. stuntzii* grow on wood chips and contain unknown molecules which can cause paralysis (wood lovers paralysis). He urged the board and the public to avoid cultivation and consumption of these species, especially on wood based substrates, until further research into this phenomenon is completed and conclusions are drawn.

He noted that of the ~220 species in the fungal genus *Psilocybe*, ~116 are psilocybin active, and the rest don't produce psilocybin.

He described distribution, fungal ecology, and psilocybin production capacity of pacific northwest species including *P. peliculosa*, *P. semilanceata*, *P. cyanescens*, and *P. stuntzii*.

He warned that there are deadly poisonous fungi (Containing cyclopeptides and other fungal toxins) that are visually similar to *Psilocybe* species and that grow in the same environments. These extremely toxic species include *Gallerina autumnalis* and *Conocybe filaris* (synonym *Pholiotina rugosa*) among others. They are nearly indistinguishable using morphological features, and spore color/size, and microscopic features necessitating the use of modern fungal identification techniques such as DNA sequencing by experts.

He discussed the benefits of varying psilocybin dose and focused on sub-perceptive levels or 'microdoses' for decreasing cognitive decline and increasing creativity, drawing conclusions from data gathering tests for visual acuity, memory, and subjective emotional experiences.

He presented data on combining beneficial fungi such as lion's mane (*Hericium erinaceous*), psilocybin containing fungi, and the vasodilator Niacin.

#### **IV. Subcommittee & board discussion with Paul Stamets**

David Hart asked about strategies to standardize product consistency and current Good Manufacturing Practices (cGMP). Paul responded that cGMP processes differ for mushrooms (agricultural or food safety) and for mushroom extracts (pharmaceuticals), and that organic production standards are higher than for non. He noted issues for fungal production facilities include (post-harvest) mold growth, mushroom senescence, mushroom infection by bacteria, viruses, insects, nematodes, and other fungi.

Rachel Knox asked about non-psilocybin/psilocin-based chemicals in fungi and the species that produce them in varying amounts. Paul responded that norpsilocin and norbaeocystin (psilocybin analogues) stimulate neurons in vitro and provide anti-inflammatory services. He suggested focusing on *P. cubensis*, *Panaeolus/Copelandia cyanescens*, and *P. subcubensis* as initial species for cultivation. He also suggested considering mushroom size and senescence rates when selecting species for cultivation as these differ by fungal species.

Todd Korthuis expressed interest in executing future clinical trials comparing the effects of synthetic and natural mushroom-based psilocybin. Paul commented how valuable the data from such a study would be and charged the committee to enable this research.

Todd Korthuis asked how placebo effects may play a role in psilocybin-based healing. Paul replied that while placebo effects are non-trivial, statistical significance in clinical trial data are unlikely to be explained by placebo effects.

Jessie Uehling asked what research is necessary to better understand wood lover's paralysis. Paul responded that evaluating gene expression by substrate and the bioactivity of molecule production may illuminate these issues.

Jessie Uehling asked about specialty facility equipment necessitated by fungal cultivation. Paul referenced HVAC systems with HEPA filters; PPE such as masks, gloves, and hairnets; sticky mats at doors; documented hygiene protocols; and partnered working double checkmark systems. He then suggested a training program for cultivators and manufacturers.

Jessie Uehling inquired about substrate-based contaminants that have potential to carry over to food products and or extracts. Paul suggested monitoring for insecticides (malathion, methyl bromine) and other chemical carry over from plant materials especially from international imports or sources where chemical regulations differ from food product standards. He also suggested considering how compost-based cultivation attracts flies and affects neighbors. Lastly, he warned of associated dangers cultivating on dung.

Ali Hamade asked about the accumulation of heavy metals (cadmium, lead, mercury, arsenic) and pesticides in mushrooms. Paul suggested leaning on organic production and tempering analytical techniques based on thresholds for public health concern. He also warned about regulating organic certification on a facility that is processing imported products, as this has been an issue in the beneficial mushroom production market.

David Hart inquired about fungal allergy mechanisms and specificity of fungal species to induce allergic reactions. Paul replied that spores induce greater allergic reactions than other fungal tissues, and that adverse human response to fungi can increase over time and exposure to individual species. Jessie Uehling added immune system recognition of fungal cell wall components and metabolites may vary by species and individuals and change with exposure over time.

Jessie Uehling asked about the variability of psilocybin content within and between species; and how psilocybin degrades over time, heat, and light exposure. Paul responded that mushrooms differ vastly between individuals of the same species, within a species over time, and between species.

Jessie Uehling asked how fungal strains can be stored to reduce genetic mutation accumulation over time. Paul answered that replicating a stock culture at very low temperatures and limiting ambient condition culture passaging will reduce mutation accumulation associated strain performance decline.

## **V. public comment**

Allison Westhoff encouraged the board to maintain a focus on accessibility and affordability at the forefront of license-associated rule suggestions.

Michele Wiseman suggested considering truffle forming *Psilocybe* species as alternatives for non-spore producing fungal cultivation.

Del Potter commented on the value of cultivation standards, sporulation avoidance mechanisms, research on non-psilocybin bioactive fungal products.

Kyle Meyer suggested a centralized Oregon strain bank.

Minutes prepared by Jessie Uehling 14 June 2021