



The National White-Nose Syndrome Decontamination Protocol

ABSTRACT

Pseudogymnoascus destructans (Pd) is a fungus that causes White-Nose Syndrome (WNS) in hibernating bats. The fungus grows on the bats nose, wings and ears and is highly transmissible between bats and also by human-assisted transmission from cave to cave. Caving is becoming more popular, either from a scientific point of view or recreationally. The fungus is causing severe mortality within bat populations across the United States and eastern Canada. It was estimated in 2012 that 5.7-.6.7 million bats have died because of WNS, some species seeing mortality of up to 98%. This is raising concern over potential impacts this may have on ecosystems, such as insect control, pollination or seed dispersal. With no known cure, biosecurity must play a critical role in prevention. The "National White-Nose Syndrome Decontamination Protocol" is a comprehensive protocol that highlights cleaning and disinfection. Accelerated Hydrogen Peroxide (AHP®) is recognized as the cleaner, faster and safer disinfectant technology. This protocol recommends the use of AHP® for decontamination of cave equipment/material that has been exposed to the fungus.

BACKGROUND

The purpose of this protocol is to provide direction on infection control measures to effectively clean and disinfect clothing, footwear and equipment that may have been exposed to Pd. The following procedures are designed to reduce the risk of human-assisted transmission of the fungus to other bats and/or habitats.

WHITE-NOSE SYNDROME

The fungus *Pseudogymnoascus destructans* (Pd) is the primary cause of White-Nose Syndrome (WNS). It gets its name from the distinctive white fungal growth around the nose and even wings or ears of the bats. The first documented case occurred in New York in 2006 and has since resulted in record mortality of hibernating bats throughout eastern North America, and now continues to threaten the Northeast, mid-Atlantic, Midwest, Southeast states as well as eastern Canada.

The fungus is said to originate in these caves as it favors cool, damp conditions and temperatures of 41-57 degrees Fahrenheit. Once one bat is infected, the disease can be easily transmitted from bat-to-bat, especially with close proximity when hibernating. The fungus is also spread from cave to cave via human-assisted transmission; fungal spores have been found stuck to clothing and caving equipment. As of now, there is no evidence that the disease is zoonotic, or spread to other species.

When a bat becomes infected, they start to show unusual behavior which can include flying during the day in the summer, or leaving caves during their winter hibernation when no bugs are present for them to consume. It has been confirmed that the disease is killing the bats by causing their bodies to overheat. This is accomplished by the bat burning energy too quickly, and during winter, no insects are present to replace lost calories. When the bats leave the cave during the winter, it is far too cold for the mammal to survive and they freeze to death quite quickly.

THE RISKS

Bats provide a number of benefits to ecosystems, such as insect control, plant pollination and seed dispersal. With WNS spreading vastly, it is raising concern over potential impacts this may have on ecosystems. Insect control is a top priority as research has found that there have been yearly savings of over \$3 million in pesticide application costs across the United States to bats' pest control services.

Furthermore, with the extreme high mortality, and the low reproductive rate of bats, there are some concerns that bat populations may never recover to what they were pre-WNS. There is even concern for extinction as some bats were already on the endangered species list, such as the Indiana bat and the northern long eared bat.

DISINFECTION METHODS

Since WNS has no known cure and is difficult to treat, infection control measures must be put in place that can effectively limit the human-assisted transmission. Disinfection of all clothing, footwear and equipment that enter known or suspected caves with the fungus is imperative and must be executed.

When on site, dirt/sediment needs to be removed from the equipment. The exposed equipment then needs to be immediately contained in sealed bags/containers for treatment away from the location. However, disinfection of the outside surface of the bags/containers needs to occur prior to moving with an appropriate product listed in the protocol.

When off site, treatment of equipment with a disinfectant is mandatory with submersible and non-submersible equipment, again using an appropriate product listed in the protocol. Removal of dirt/sediment must be done first, and cleaning is to follow with a recommended detergent. Then treatment with a disinfectant on the equipment must be done in accordance with manufacturer's recommendations. A rinse step is recommended, only if appropriate for that specific equipment. Lastly, decontamination is required on equipment bins, sinks, countertops and other laboratory, office or home areas with the recommended products in the protocol.



CONCLUSION

This protocol was designed to provide recommendations to effectively clean and treat clothing, footwear, and equipment that may have been exposed to Pd. Cleaning and disinfection will play a vital role in preventing the human-assisted transmission of this deadly fungus. With this decontamination protocol, it aims to reduce the spread of the fungus and help regain, over time, the bat species population which play a pivotal part in many ecosystems. Therefore, disinfectants should be part of any infection control protocol and should be chosen based on their efficacy profile without harming animals, humans or the environment. AHP® was specifically mentioned in this protocol as an effective disinfectant technology and will continue to be recognized as an industry leader supported by its pillars of strength.

IMPLICATIONS FOR AHP

With caving becoming more popular, scientifically or recreationally, and knowing humans are assisting with the transmission of WNS, this protocol recommends the use of AHP for decontamination measures. AHP® is safe to use for the users and also animals, it is non-toxic and non-irritating. AHP® is easy to use and easy to transport between caves or research facilities. The use of AHP® is an effective way to decrease the transmission of this fungus on cave equipment/material.

AHP® Disinfectants are One-Step Disinfectant-Cleaners

- AHP® has proven cleaning efficacy resulting in lower costs and faster results as well as added confidence that disinfection can occur

AHP® Disinfectants provide the perfect balance between safety and efficacy

- AHP® is designed to be easier on employees and occupants resulting in protocol compliance.
- AHP® provides a HMIS rating of "0", meaning that handling the product does not require the use of personal protective equipment which means less cost and downtime

AHP® Disinfectants are compatible

- AHP® formulations are tested to ensure compatibility that preserve your investments in equipment, furniture, and building surfaces

AHP® Disinfectants have realistic contact times

- Short contact times ensure surfaces remain wet for the required contact time, providing comfort and confidence that disinfection has occurred

AHP® Disinfectants are environmentally sustainable

- AHP® active ingredient, hydrogen peroxide, breaks down into water and oxygen leaving no active residues
- AHP® is formulated to ensure that it will not negatively impact indoor air quality

REFERENCE

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