

Effect of Black Pepper Exterminating Ants (Hymenoptera: Formicidae)

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Abstract: An experiment was conducted to determine if ground black pepper could effectively exterminate ants (Hymenoptera:Formicidae). Ants were isolated from an ant mound at The Reserve, apartment complex in College Station, Texas USA. The ants taken from the same colony were placed in two separate bowls. A mixture of ground black pepper and water was created and added to a spray bottle. Bowl A was sprayed with a mixture of black pepper and water and bowl B was not. Then they were left alone for an hour, and then observations were made and recorded. Results showed that they sprayed bowl had a number of dead ants. This concluded that this treatment was effective in exterminating ants.

Keywords: Hymenoptera, ants, black pepper, Formicidae

Ants are ranked the number one urban pest by the structural pest control industry, with an estimated 1.7 billion dollars generated annually for Pest Management Professionals (PMPs) in the United States (Field 2007)

Some of the most common ant species found in apartment complex are *Camponotus spp.* also known as carpenter ants. They can destroy wood by excavating tunnels that they can live in. (Morgan 1997) Also, *Solenopsis spp.* or Fire ant. In 1998 they cost Texas more than \$580 million dollars in damages. (Chenault 1999) They can also cause

medical problems, as a sterile female ant stinger injects venom that can cause blisters and whole body allergic reaction such as anaphylactic shock. (Drees 2014)

There are many ways to treat an ant infestation in your home. There are many natural and chemical treatments associated with treating ant infestation. However, some chemical treatments like professional extermination can cost anywhere from \$100 to 300 dollars, depending on the location and the size of the property. Any in store products cost from \$10 to 50 dollars. (unpublished data)

Some methods can be done yourself and be as simple as grabbing an item from your pantry. While researching common DIY treatments for ant control, one method mentioned was using black pepper. Being that this is a very common and inexpensive household item; it's believed that many people would be inclined to use this treatment. An experiment was conducted to test if this treatment would be effective in ant control. It is anticipated that this treatment would not be effective.

Methods and Materials

Ants were isolated from a pile at The Reserve an apartment complex in College Station, Texas, USA using a red solo cup. (Dart Container Corporation, Mason, MI) First scoop was placed in a white paper bowl A, to be able to see the ants clearly against the bowl. (Reynolds

Kitchen, Lake Forest, Illinois) Then a second scoop was placed in Bowl B. Then four ounces of water and a generous amount of black pepper (McCormick, Baltimore, MD) was added to an empty spray bottle. (Procter & Gamble, Cincinnati, OH). The spray bottle with the mixture was then shaken thoroughly. Bowl A, the experimental bowl was sprayed with the mixture, while bowl B, the control was not. The bowls were left alone for an hour and then observed.

Results

After an hour, bowl A showed a large number of dead ants and bowl B had no dead ants. Figure 1, is the two bowls before bowl A was sprayed with black pepper and water. Figure 2, is after being left in the mixture for an hour.



Figure 1: Bowls with ants from the ant pile



Figure 2: Bowl after an hour sprayed with black pepper and water mixture.

Discussion

It was concluded that the mixture on black pepper and water sprayed over ants was effective in killing them.

Having an inexpensive effective method can be very beneficial to people that ant infestation. The cost of professional extermination is pricey, depending on your location and how extreme your problem can be. Most people would prefer to not spend money on situations that are out of their control. The products sold in store are not always guarantee to be effective and depending on your ant species they might not work at all.

Ground pepper can be an effective alternative as this experiment supports that it kills ants living outside of an apartment complex.

The elimination of these infestations is critical as the presence of carpenter ants can indicate that a building has problems such as moisture or rotting

wood. (Brown and Gold 2012) Also, fire ants can cause great harm to residents living in apartment complexes.

Although the ants in the treated bowl died, it could be possible that they were killed by drowning in the water rather than the actual pepper. In order to determine if this is in fact what happened, possibly with varying amounts of pepper and water or with, ground pepper. Overall, the purpose of the mixture was to kill the ants and that is what it did. Therefore, homeowners should trust that this treatment will assist them in getting rid of these pests.

This is why having an inexpensive method that works is beneficial because instead of spending an extreme amount of money or purchasing something that isn't guarantee to work.

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