Investigating the Effectiveness of Fungicides on Disinfecting Ceratocystis Lukuohia Fungi Spores From Ambrosia Beetle Frass

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Over the course of the years, recent studies indicate a significant decline in Hawaii's native ohia lehua tree population. This is due to a fungal plant pathogen called ceratocystis lukuohia or otherwise known as rapid ohia death. Ambrosia beetles are key transmitters of this disease as they excrete frass that contain C.Lukuohia spores. This project hypothesized that if three different fungicides (propiconazole, chlorothalonil, and copper octanoate) were used as a surface disinfectant for the C.lukuohia spores in the ambrosia beetle frass, then propiconazole would be the most effective to inhibit the growth. Under a sterile hood, 5 mg of C.lukuohia infected frass was placed onto a dish in which a micropipette was used to place 5 microliters of fungicide onto the frass. The carrot baiting method was used in which the wetted frass was placed in between two carrot discs as a growing medium and was placed into plastic bags. All of this was repeated for 5 trials for each of the fungicides whereas the control had no fungicide. After 7 days of growing in room temperature, the zone of inhibition and growth were measured with a ruler in mm and then averaged. Propiconazole proved to be the most effective fungicide with an average zone of inhibition of 93% and an average zone of growth of 7% proving the hypothesis to be correct. Whereas copper octanoate was the least effective with an average zone of inhibition of 10% and an average zone of growth of 90%. This may be because propiconazole is a systemic fungicide while the other fungicides were contact fungicides. This study shows that systemic fungicides are more effective. These methods could potentially save Hawaii's rain forests and communities from rapid ohia death and be utilized in a way to minimize the spread.

Awards Won: