The Effect of Thiamine on Hedera helix to Inhibit Rhizopus stolonifer Fungus

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The purpose of this project was to find a cost-effective solution that reduces detrimental health problems by inhibiting indoor mold growth utilizing Hedera helix plants, known to contain medicinal properties that remove toxic atmospheric fungus spores. The World Health Organization reported 40% of the population exposed to Rhizopus stolonifer, the most common indoor and outdoor mold encountered worldwide across high temperatures and humidities, experienced asthma, sinusitis, and mucormycosis, which are deadly to immunosuppressed individuals. The hypothesis was if Rhizopus stolonifer was placed in sealed containers of different growth conditions: Hedera helix in a culture medium with 2.4%w/v thiamine, 2.1%w/v agar medium without growth-promotion vitamins, and without plants, then the thiamine medium has greater effective rates of inhibiting mold because thiamine resists fungal infections by stimulating plant cells. DHT22 sensors were programmed in Arduino IDE and deployed in 3D-printed sealed containers to monitor and display relative humidity and temperature levels on LCD screens during plant growth. Images of mold development in potato dextrose agar petri dishes placed in the containers were captured using endoscope cameras to calculate statistical percentages of mold area detected through color pixel analysis partitions utilizing digital image processing. Both thiamine and agar media samples had a significant 68% mold inhibition rate with approximately the same decreasing levels of average relative humidities and temperatures. No significant differences were observed between media types as all treatments of Hedera helix successfully inhibited mold growth and reduced atmospheric toxic particles; thus, potentially alleviating health issues.

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