The Power of Plants: Comparing the Antifungal Effects of Different Forms of Ocimum basilicum (sweet basil) Against Aspergillus niger

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Aspergillus niger is a common fungus that causes black mold on food crops. Existing fungicides pose environmental risks, face increasing resistance mechanisms, and are difficult to practically implement, leading to a demand for the development of innovations to face the problem of plant pathogenic fungi. In this project, the efficacy of Ocimum basilicum (sweet basil) distillate and powder against A. niger were tested in vitro. Basil powder was obtained, and a portion of the powder was reserved while the rest was steam distilled to produce an aqueous distillate. The distillate was incorporated into plating media before inoculation with A. niger, while the powder was added onto the surface of standard plates after inoculation. 90% ethanol was the positive control and standard plating media was the negative control. All plates were incubated at 35 degrees Celsius for 48 hours with observations after each 24 hour period. Data were analyzed using a P-test. Both distillate and powder plates showed significantly decreased average mycelial diameters compared with the standard plate within the first 24 hours, but the difference was greatly reduced after 48 hours. The 90% ethanol showed similarly diminishing effectiveness, indicating the possible role of volatility in the reduction of efficacy over time. Given the observed fungistatic activity of minimally processed forms of the plant, basil presents a promising lead for development as an environmentally conscious, practical, and novel tool to combat A. niger. Further research will determine basil's in vivo effectiveness and distribution methods for use in agriculture.

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