Effect of Natural Products Against Growth of Three Allergenic and Toxigenic Molds

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**Introduction**

- Dampness and fungal exposures in buildings are widespread, with estimates ranging from 18% to 50% of buildings being affected. Of the 21.8 million people reported to have asthma in the USA, approximately 4.6 million cases are attributable to dampness and mold exposure in the home.
- Several fungal genera from damp environments were reported to be associated with allergy and/or asthma and some species can release mycotoxins in the environment.

**Purpose**

In this study, we have evaluated three plant based products - tea tree oil, grape fruit seed extracts, and natural vinegar - against growth of three specific allergenic and toxic mold species (*Aspergillus versicolor*, *Penicillium brevicompactum*, and *Stachybotrys chartarum*).

**Methods**

- Spore solutions (10^4–10^7 spores/mL) of these three mold species were prepared from pure cultures and 200 µL of solutions were spread over malt extract agar plates.
- Three 20 µL drops of different dilutions of three above-mentioned natural products were applied on agar plate surfaces immediately after spore solution inoculation.

**Results**

- Inhibition zones on agar plates were examined after the incubation of plates for 96 hours at 30±2°C

**Conclusion**

- We found that up to 10 times dilutions of grape fruit seed extracts developed 18-50 mm zones of inhibition for all mold species, up to two times dilutions of tea tree oil completely inhibited all three species but 5X dilution was effective for *S. chartarum*. Natural vinegar, on the other hand, inhibited *S. chartarum* and *P. brevicompactum* only and the inhibition zones for mold growth on agar surfaces were 18-28 mm.

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**Introduction**

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**Figure 1:** The effect of grapefruit seed extract on *S. chartarum*

**Figure 2:** The effect of tea tree oil on *P. brevicompactum*

**Figure 3:** Box plot showing the effect of grapefruit seed extract on *A. versicolor*

**Figure 4:** Box plot showing the effect of grapefruit seed extract on *P. brevicompactum*

**Figure 5:** Box plot showing the effect of grapefruit seed extract on *S. chartarum*

**Figure 6:** Box plot showing the effect of vinegar on *P. brevicompactum*

**Figure 7:** Box plot showing the effect of vinegar on *S. chartarum*