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Effect of Natural Products on Overall Microbial Activity in Household Items

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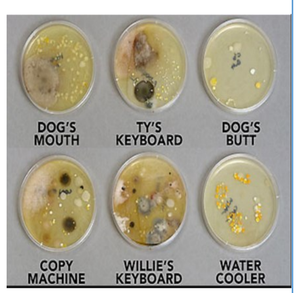
Background

Indoor contamination from microorganisms is an important health hazard issue (e.g., respiratory allergy, infections, and food contamination). Particularly, growth of molds and bacteria in damp environmental conditions could be hazardous for the occupants susceptible to microbial allergens. The growing awareness concerning the adverse effects of chlorine bleach and cleaning chemicals calls for field-testing new natural ingredients with functional properties against microorganisms. Essential oils possess a wide spectrum of antimicrobial activity, which may be of great importance for controlling indoor microbial exposure.

Purpose

The objective of this study was to investigate how microbial growth in different surfaces of homes reacted to the application of natural products serving as a health harmless aid to rid the home of microorganisms.



http://www.easlabs.com/photo-gallery/damage-from-mold/

http://www.techeblog.com/index.php/tech-gadget/bacteria-growth-science-kit

Methods

- The natural products consisted of tea tree oil, natural vinegar, and grapefruit seed extract, which demonstrated antifungal properties in our other studies.
- To assess microbial load before and after treatment of the natural products, ATP levels were monitored.
- Each natural product was used in between pre-treatment and post-treatment swabbing of the suspected damp surfaces (toilets and windows) in home environments following a standard CDC protocol and levels of ATP in swab extracts were measured by a luminometer.

Results

Results showed a consistent 10-times decrease in the ATP analysis of the toilet after using all three natural products, although pre-treatment recordings took place above the threshold. Tea tree oil had no effect on the microorganisms on the window due to microorganisms not being sensitive to such a natural product. The increase noted in the ATP analysis containing the natural products tea tree oil and vinegar from the window could have also resulted from the sensitivity of the ATP. However, a 56% decrease was noted in the ATP analysis of the window after use of the grapefruit seed extract.

Fig. 1. The accumulation of mold in a toilet

Fig. 2. Mold on a window sill

Conclusion/Recommendations

It was concluded that grapefruit seed extract had a greater inhibitory effect on household items such as the toilet and window seal. Tea tree oil had an obvious effect as well, and further testing will be performed using such. Vinegar, however, posed little to no effect at all when observing microbial activity. Therefore, the use of natural products on household items proved to be effective in inhibiting microbial activity.

ATP Levels			
	Natural Product	Before (RLUX)	After (RLUX)
Toilet	Tea Tree Oil	2902	357
	Vinegar	1268	145
	Grapefruit Seed Extract	1010	92
Window	Tea Tree Oil	8099	8192
	Vinegar	1158	2086
	Grapefruit Seed Extract	7187	4049

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