CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY

Name(s)

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Project Number

S2203

Project Title

The Effects of Synthetic and Natural Antifungal Medications on the Growth and Viability of Saccharomyces cerevisiae

Abstract

Objectives/Goals

Determine the effectiveness of two different synthetic and natural antifungal medications on limiting the growth of Saccharomyces cerevisiae over time.

Methods/Materials

The synthetic medications used were terbinafine hydrochloride and clotrimazole. The natural medications used were coconut oil and tea tree oil. The S. cerevisiae were cultured on petri dishes. All medications were sprayed onto the S. cerevisiae cultures. The mass of S. cerevisiae while exposed to each medication was recorded in 6 hour intervals over the span of 48 hours.

Results

The overall mass decrease (final minus initial mass) of S. cerevisiae after exposure to each medication showed the effectiveness of the medications. From greatest to least mass decrease, the results were: terbinafine hydrochloride (0.928 g), coconut oil (0.919 g), tea tree oil (0.890 g), and clotrimazole (0.855 g). Terbinafine hydrochloride was the most effective in limiting cell growth, while clotrimazole was the least.

Conclusions/Discussion

The simplicity of each medication's mechanism of action in disrupting S. cerevisiae cells determined the medication's effectiveness. This shows that the general type of medication (synthetic, natural) does not impact the overall effectiveness as much as the mechanism of action of each medication's active ingredient.

Summary Statement

We found that the main factor in determining an antifungal medication's effectiveness was its mechanism of action.

Help Received

We designed and performed the experiments ourselves after thorough background research.