

Antimicrobial Properties of Exoskeletons

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Antimicrobials that are used in the medical field are chemically altered and take a lot of hard work to create. In this experiment, we are comparing the antimicrobial ability of arthropod exoskeletons with store bought antimicrobials. By proving that these exoskeletons are effective in eliminating bacteria, there may be opportunities for medical advancements using materials that are significantly cheaper and more accessible than creating similar compounds in a lab. We tested a centipede, wasp, and moth exoskeleton for antimicrobial properties against three different bacterial strains. The bacteria included *Micrococcus luteus*, *Staph Epidermis*, and *Staph Aureus*, and they were swabbed on multiple agar plates. Paper discs were dipped in the essence of the arthropods and placed on the plates. We then waited 24 hours to see how much bacteria was eradicated from the vicinity of the discs. The eradication of *Micrococcus luteus* after 24 hours measured an average of 0.18cm for the centipede essence, 0.15cm for the wasp essence, and an average of 3.57cm for the Bacitracin. *Staph Aureus* was measured as an average of 0.07cm for the centipede, an average of 0.04cm for the wasp, and an average of 1.9cm for the Bacitracin. *Staph Epidermis* measured an average of -0.027cm for the centipede, -0.01cm for the wasp, and an average of 1.17cm for the Bacitracin. This experiment showed that exoskeletons can be utilized as more accessible means to create antimicrobials in medicine. The exoskeletons successfully eradicated most bacteria, suggesting that they have antimicrobial properties. Further experiments will solidify whether these exoskeletons have the potential to be as effective, if not more so, than lab made antimicrobials.