Using the Kirby Bauer Method To Test the Effectiveness of Phenols Extract From Pecan Shells and Saponin Extract From Prickly Pear Cactus in Inhibiting the Growth of E. coli

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The NMMI stem team engaged in a project that utilized and incorporated naturally occurring materials to produce a viable alcohol-free and eco-friendly hand sanitizer that could rival competing alcohol and other harmful anti-pathogenic based agents. Our main focus was to prioritize the safety of our community, as we are still in the midst of a global pandemic. COVID-19 has not only affected our physical health, but it has also deeply rooted in our socio-economic downturn which, as a result, has caused rapid deterioration of the world. Our project utilized the natural resources of New Mexico, in particular Roswell, such as pecan shells and prickly pear cactus to not only create a bactericidal and potentially fully anti-pathogenic agent. It is also a means of economic stimulation as we can find purpose and utilize the pecan shell waste that is typically burned off into the environment. Our procedure consisted of two parts, the extraction and testing. The extraction consisted of isopropyl alcohol and a 3-1 mixture of ground up pecan shell and cactus. Testing consisted of culturing E. coli and using the Kirby-Bauer method and comparing it to other commercial hand-sanitizers. Consistent zones of inhibition were observed in our hand-sanitizer. Our hand sanitizer proved to be effective at inhibiting the growth of E. coli. We were able to produce a viable hand sanitizer that is both cost-effective and eco-friendly.

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