

Effects of *Prosopis glandulosa* Leave Extract on Lowering the Antibiotic Resistance of *Escherichia coli*, *Sarcina lutea*, and *Staphylococcus epidermidis*

Romero, Andrea (School: Harvest Preparatory Academy)

Antibiotic resistance is one of the world's most urgent public health problems. Every year in the US, around 2.5 million people get an antibiotic resistance infection, while 35000 people ended up dying. This research investigated how *Prosopis glandulosa* (honey mesquite), a native Sonoran Desert plant, leaves extract can lower the antibiotic resistance of three different bacteria. To get the leaves extract, glycerin extraction was performed consisting of 680g of dried leaves soaked in glycerin and distilled water solution with 1:1 ratio. 5 isolated pure colonies of *E. coli*, *S. epidermidis*, and *S. lutea* were diluted into 2mL of sterile saline solution to prepare inoculums for Kirby-Bauer Antibiotic Assay. Part 1 investigated the antibiotic property of *P. glandulosa* extract alone using sterile paper discs with 20 μ L of extract. Part 2 investigated the effects of adding *P. glandulosa* extract into different antibiotics. 5 replicates of experimental (antibiotics + extract) and control treatments (antibiotics only) were prepared for each bacterium. Data were analyzed using one-way ANOVA. Paper discs consisting of *P. glandulosa* extract showed intermediate effects to all bacteria (Zones of Inhibition=15-19mm). Among all the antibiotics, Neomycin had significant effects to all tested bacteria when mixed with *P. glandulosa* leave extract with all zones of inhibition higher than 25mm (all p-values <0.05). All antibiotics showed significant effects on lowering the antibiotic resistance of *S. epidermidis* when mixed with *P. glandulosa* extract (p-values: Penicillin=0.005, Ampicillin=0.0009, Neomycin=0.002, Erythromycin=0.00002). The results support recent research suggesting pharmaceutical potential of *P. glandulosa* and a possible tablet binder agent.

Awards Won:

University of Arizona: Renewal Tuition Scholarship