

# Antimicrobial Activity of *Artemisia tridentata*

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## Introduction

Plants secrete substances to create more favorable living environments. Chemicals produced by plants may be used to kill competition or to modify the plant's microbiotic environment.

Those who study medicine have long used these substances to treat symptoms and disease. *Artemisia tridentata*, commonly referred to as "Big Sagebrush," is traditionally used by Native Americans to relieve stomach pain, colds and coughs, sore eyes, snake bites, and as an insect repellent.

We are interested in studying the reported medicinal properties of *A. tridentata*, specifically its antimicrobial properties. In this experiment, we tested extracts made from samples of various parts of the sagebrush to discover if they inhibited several strains of human and plant pathogens.

Figure 1– *Artemisia tridentata*



## Methods

### • Sample Collection

Samples of *A. tridentata* leaves, twigs, and flowers were collected from various locations in Green Canyon.

### • Preparation of Plant Extracts

The collected samples were washed and dried for a month. They were then ground to a fine powder and methanol was used to create a concentrated solution. The solutions were then dried using a rotary evaporator.

### • Antimicrobial Assay of Plant Extracts

The dried extracts were resuspended in Dimethyl Sulfoxide to 50mg/ml. *E.coli* Dh5 $\alpha$ , *Agrobacterium tumefaciens*, *Pseudomonas syringae* pv DC3000, and *P.syringae* pv tabaci were tested for growth inhibition on Mueller Hinton Agar.

50 $\mu$ l of leaf, twig and flower extract were used, along with 10 and 25 $\mu$ g ampicillin.

Plates were incubated for 12-16 hours in incubator and observed for zone of inhibition.

Figure 2 – Extraction

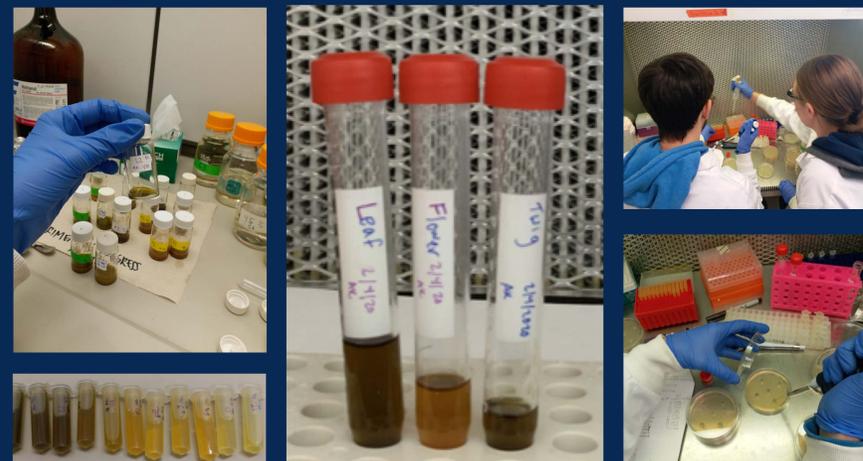
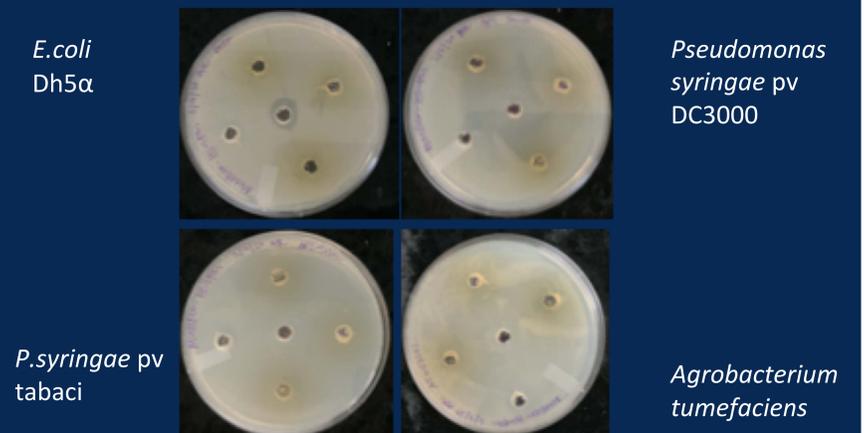


Figure 3- Results



## Results and conclusion

- Preliminary results showed that *Artemisia tridentata* does inhibit antimicrobial activity. The protocol used called for a low concentration of plant extract, and as a result, a small to no zone of inhibition showed on the plates.
- The protocol suggested using 10  $\mu$ g ampicillin but no results showed. We increased amount to 25  $\mu$ g ampicillin and a small zone of inhibition could be observed, but in the future we will further increase the amount of antibiotic used as a positive control.
- The next step in this research will be to standardize protocol, finding the best concentration at which the antimicrobial activity of *A. tridentata* can be observed.
- We will also test a wider variety of microbes and antibiotics.

## References

Manandhar, Sarita, Shisir Luitel, and Raj Kumar Dahal. "In Vitro Antimicrobial activity of some medicinal plants against human pathogenic bacteria." *Journal of tropical medicine* 2019 (2019).

