

Rhus coriaria aka Sumac

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Introduction

Sumac is a plant which is most known as being used as a spice and a dye. In addition to this, it also has biological activity. It has been used as an antioxidant, antimicrobial, antifungal, anti-inflammatory, antidiabetic, an anticancer. It also has effects on the cardiovascular system and is used as a wound healer⁽¹⁾. The journal of medicinal food states that studies should be done to study sumacs effectiveness against COVID-19⁽²⁾.

Methods

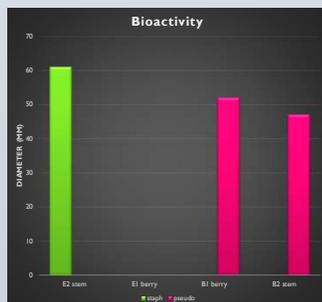
Plants were obtained from the Pickman River Salt Marsh at Salem State University in Salem, MA. They were then sanitized and plated on potato dextrose agar. The growth from the plates was then put into potato dextrose broth. After four weeks metabolites were extracted from the broth and processed in the Waters LC-MS. Different compounds were then found and researched for their uses. The bioactivity was also tested using several different strains of bacteria; *Staphylococcus aureus*, *Escherichia coli*, *Vibrio parahaemolyticus*, and *pseudomonas aeruginosa*.

Bioactivity

Extract 2 is from the stem of the sumac plant, it showed inhibition to *S. aureus*.

Broth 1 is from the berry of the plant, while broth 2 is from the stem, they both showed inhibition to *Pseudomonas*.

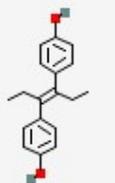
The green represents *S. aureus* and the pink represents *Pseudomonas*



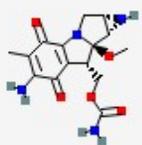
LC-MS DATA

Aiding in cancer

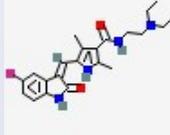
Diethylstilbestrol⁽³⁾
C18H20O2
(prostate cancer)



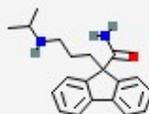
Mitomycin⁽³⁾
C15H18N4O5
(anticancer for Stomach and pancreas)



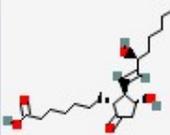
Sunitinib⁽³⁾
C22H27FN4O2
(gastrointestinal Tumors)



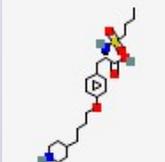
Cardiac/blood flow
Indecainide⁽³⁾
C20H24N2O
(antiarrhythmics)



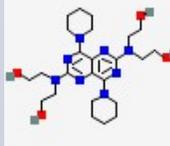
Alprostadil⁽³⁾
C20H34O5
(increases blood flow)



Tirofiban⁽³⁾
C22H36N2O5S
(anticoagulant)



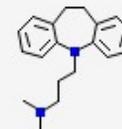
Dipyridamole⁽³⁾
C24H40N8O4
(antiplatelet properties)



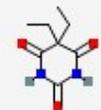
LC-MS DATA

Psychoactive

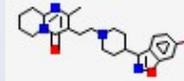
Imipramine⁽³⁾
C19H24N2
(antidepressant)



Barbital⁽³⁾
C18H12N2O3
(hypnotic and sedative)

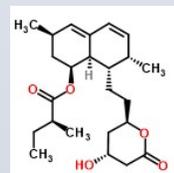


Risperidone⁽³⁾
C23H27FN2O2
(antipsychotic)

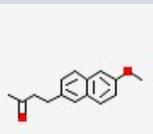


MISC

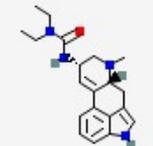
Lovastatin⁽⁴⁾
C24H36O5
(anticholesterol)



Nabumetone⁽³⁾
C15H16O2
(anti inflammatory)⁽⁵⁾



Lisuride⁽³⁾
C20H26N4O
(antiparkinson)



Conclusion

Sumac has been used traditionally for generations to treat a number of ailments. Diethylstilbestrol and Mitomycin are both useful in treating different kinds of cancer. Alprostadil is useful in increasing blood flow. This begs the question, if the years of medicinal uses of sumac is from the endophytes in the plant or the plant itself. Imipramine, Barbital and Risperidone are all psychoactive compounds that were found, however none of these were mentioned in the literature. Barbital is usually used as a sedative in veterinary medicine⁽³⁾. This indicates areas of interest that should be researched more. All compounds were found in both the berry and stem except for Tirofiban which was only found in the berry, and Risperidone which was only found in the stem. The bioactivity showed that sumac can fight off *S. aureus* and *Pseudomonas*. More compounds should be identified from the data, as only a small fraction were analyzed. It is believed antimicrobials would be found because not only was it used that way in traditional medicine but also due to the results from the bioactivity.

References

- (1) Atta-ur-Rahman; Choudhary, M. I.; Yousuf, S. *Science of Spices & Culinary Herbs: Volume 5*; Bentham Science Publishers, 2021.
- (2) Korkmaz, H. Could Sumac Be Effective on COVID-19 Treatment? *Journal of Medicinal Food* 2020. <https://doi.org/10.1089/jmf.2020.0104>
- (3) PubChem. PubChem https://pubchem.ncbi.nlm.nih.gov/#query=C24H34O3&mw_lte=371.5&page=4 (accessed 2022 -04 -29).
- (4) Search ChemSpider <https://www.chemspider.com/Search.aspx?rid=ecf08a07-57b3-4925-9c7a-3afc6cd1a0a> (accessed 2022 -04 -29)
- (5) Search Results | DrugBank Online <https://go.drugbank.com/unearth/q?searcher=drugs&query=C10H16N2O3S> (accessed 2022 -04 -29).

