

Bioactivity and Possible Medicinal Properties of Limonium (Sea Lavender)

Holly Bartlett, Christine MacTaylor, Department of Chemistry and Physics, Salem State University

Abstract

Sea Lavender plant samples were collected and examined in many different ways to identify any medicinal properties it may have. The plant samples were plated in order to grow endophytes, bacteria or fungus that live within a plant, and later were able to extract the metabolites. The extracts were processed in the Liquid Chromatography Mass Spectrometry (LCMS) machine to find any identifiable compounds within the extracts. Twenty identifiable compounds were found and connected to a medicinal use.

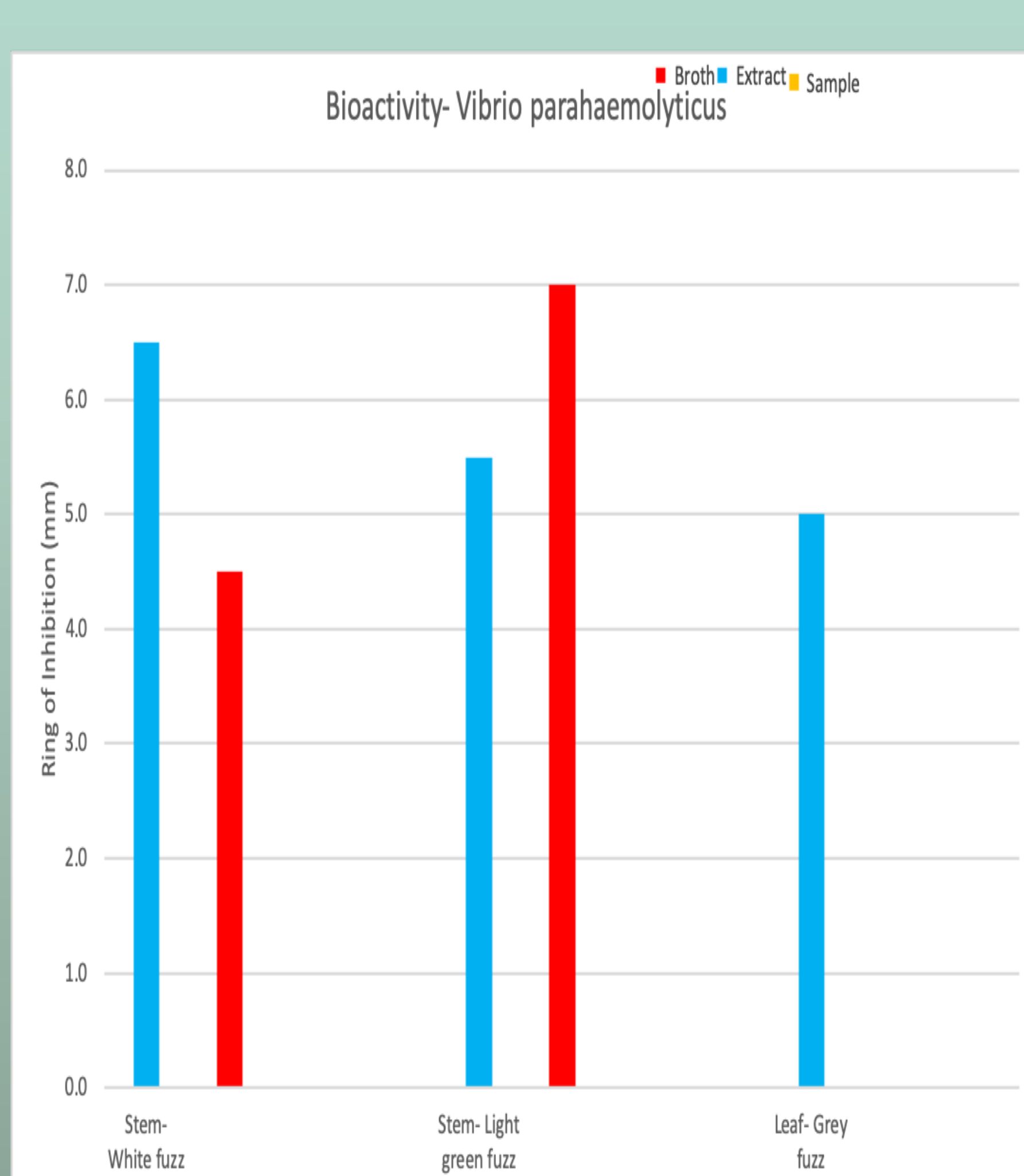
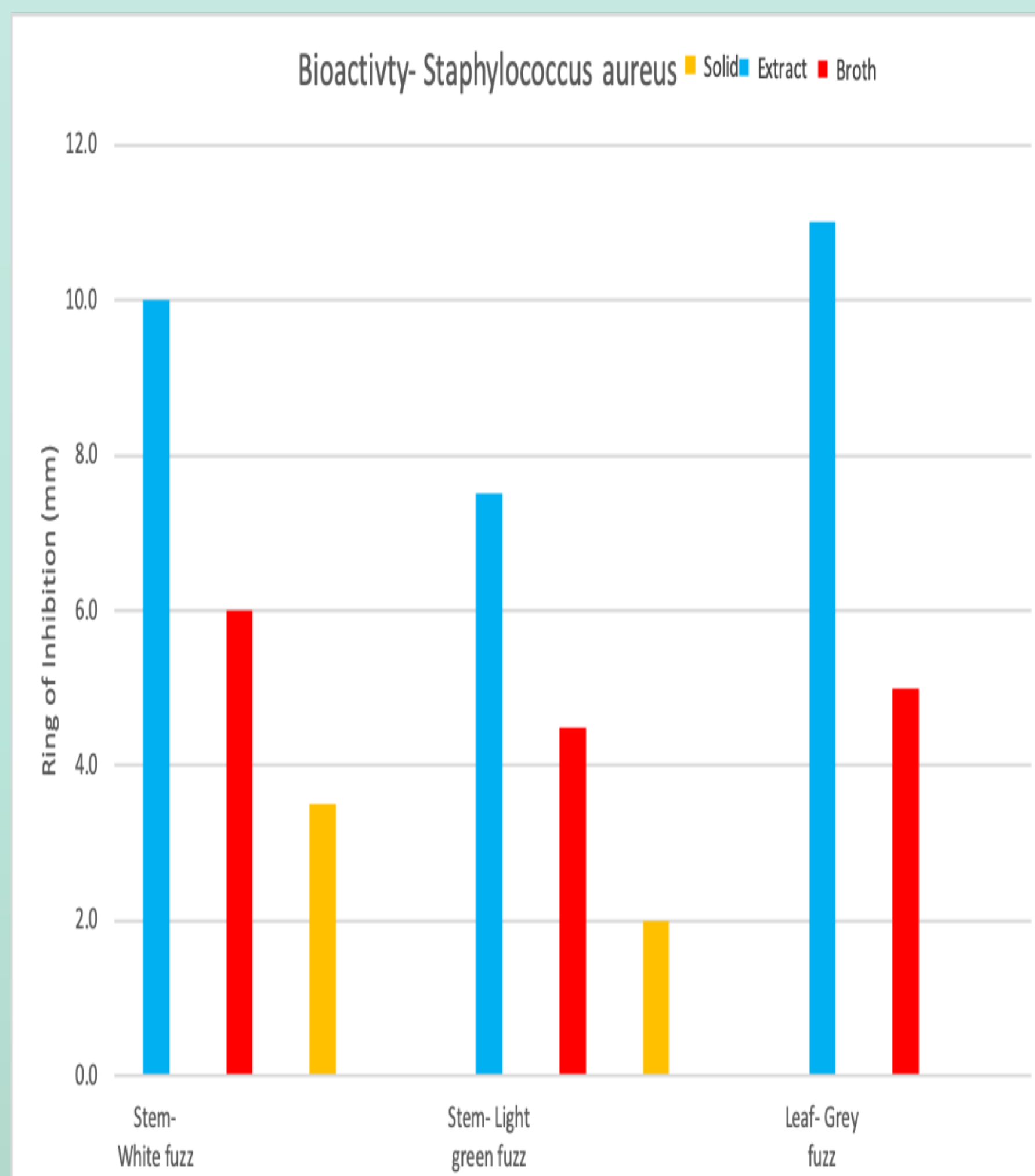
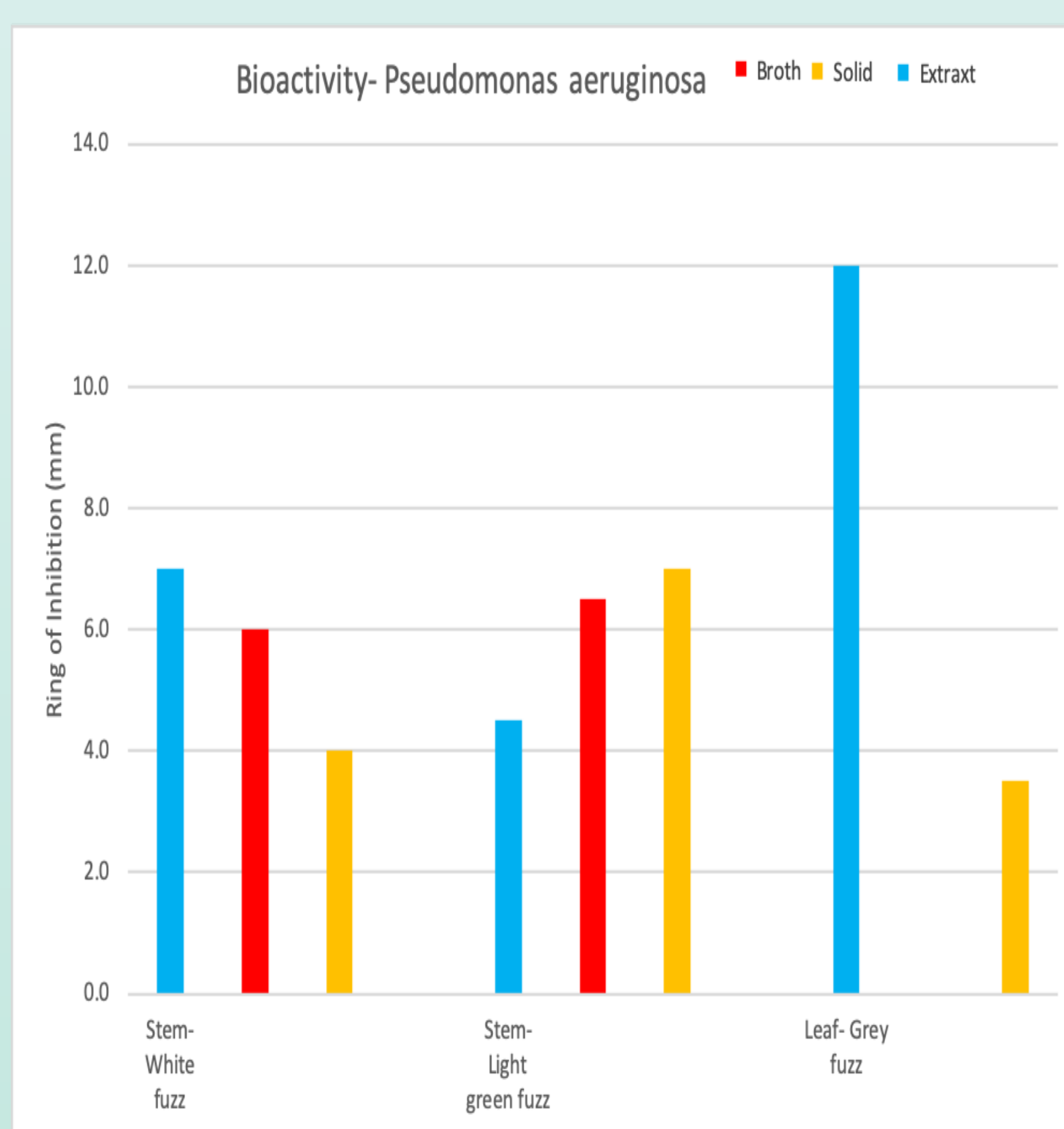
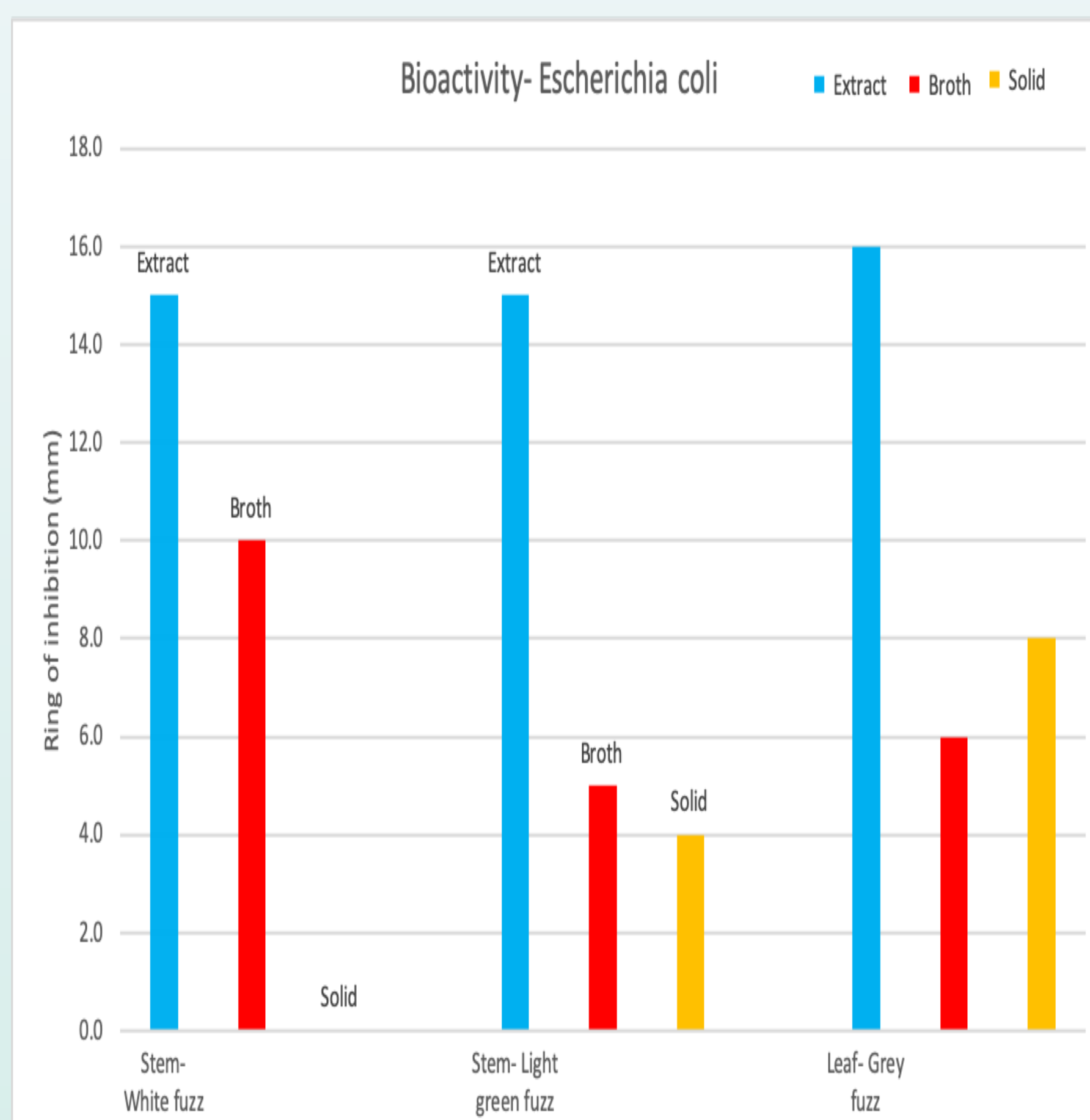
Introduction

Limonium has been used for its decongestive and depurative properties.¹ Studies have also shown that when Limonium is made into a tea, or combined with green tea, it acts as an anti-inflammatory and an antioxidant.² Finally, Sea Lavender has been used to treat diarrhea, dysentery, and is known to be astringent.³

Experimental Design

- Plant sample picked from Old Creek Salt Marsh in Salem, MA
- Sample was washed and plated to grow the endophytes
- The metabolites were then extracted
- The bioactivity was tested on four different bacteria
- The extracted were ran through the LCMS to identify compounds within the extracts

Bioactivity Results



Liquid Chromatography- Mass Spectrometry

Endocrine System			
Common Name	Structure	Sample	Use
(S)-Oxazepam		2 3	Sedative Treats anxiety and depression
Levodopa		1 2 3	Dopamine promoter
Nilutamide		1 2 3	Anti-androgen, blocks the effects of testosterone
Thiamazole		2 3	Antithyroid agent, used to treat hyperthyroidism
Metformin		1 3	Anti-diabetic drug, used to treat type 2 diabetes

Skin			
Common Name	Structure	Sample	Use
Crotamiton, (z)-		1 2 3	Anti-pruritic drug and scabicide

Excretory & Digestive Systems			
Common Name	Structure	Sample	Use
Sulfasalazine		3	Anti-inflammatory drug Can treat ulcerative colitis
Calcium Acetate		1 3	Calcium supplement to lower the levels of phosphate in the blood for dialysis patients suffering from severe kidney disease
Enoxacin		1 2 3	Antibacterial agent that was used to treat urinary tract infections
Difenoxin		2 3	Opioid used to treat diarrhea

Heart			
Common Name	Structure	Sample	Use
Clopidogrel		2 3	Can be used to prevent stroke, heart attack, or other heart complications
Lidocaine		1 2 3	Can treat arrhythmia (irreg. heartbeats)

Cancer			
Common Name	Structure	Sample	Use
Nilutamide		1 2 3	Used in chemotherapy to treat prostate cancer

Brain/Nervous System			
Common Name	Structure	Sample	Use
Levodopa		1 2 3	Used to treat Parkinson's disease
Phenmetrazine		2 3	Stimulant drug Appetite suppressant
Cathine		2 3	Psychoactive drug Appetite suppressant
Ethchlorvynol		1	Sedative Can be used to treat insomnia
Lidocaine		1 2 3	Can also be used as a pain killer or numbing agent
Prilocaine		1 3	Topical anesthetic, typically used with Lidocaine in dentistry

Bone			
Common Name	Structure	Sample	Use
Zoledronic acid		1 2 3	Treats high bone calcium levels Can treat osteoporosis
Sulfasalazine		3	Anti-inflammatory drug Can treat rheumatoid arthritis

Blood			
Common Name	Structure	Sample	Use
Clopidogrel		2 3	Blood thinner
Calcium Acetate		1 3	Calcium supplement to lower the levels of phosphate in the blood for dialysis patients suffering from severe kidney disease
PCC		1 2 3	Made of blood clotting factors, used to treat hemophilic B

Lungs			
Common Name	Structure	Sample	Use
Ethionamide		1 2	Antibiotic that treats tuberculosis

Other			
Common Name	Structure	Sample	Use
Dimercaptosuccinic acid		1 2	Heavy metal toxicity drug Used to treat lead poisoning

Conclusion

Studies have used Sea Lavender to test the anti-inflammatory and antioxidant properties when coupled with green tea.² Sea Lavender is well known for these properties as well however, only one compound was found that is used as an anti-inflammatory drug.

A study was done, similar to this one, researching the effects of Limonium on human cancer cells.⁴ The study showed a large ring of inhibition when Limonium extracts were placed on cancer cells. One compound found after the LCMS run is used to treat prostate cancer.

One other study showed that Limonium had antidiabetic properties and appetite suppressant properties as well.⁵ Many compounds were found from the LCMS that had appetite suppressant properties.

No studies were found with a connection between Limonium and the endocrine or nervous systems, however many compounds associated with those systems were found after running the LCMS. More research should be conducted to further examine any possible connections.

References

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