

Medical Properties of Sea Lavender (Limonium)

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Abstract



Sea lavender, *Limonium*, was collected from the Pickman Park salt marsh in Massachusetts as shown on the map and was plated to grow endophytes. Endophytes are the fungi that live symbiotically inside other plants and are known to have beneficial medicinal properties. In this research, they were tested, for anti bacterial properties and 16 medicinal compounds were identified

Introduction

Sea lavender is known to have a few useful medicinal properties such as treating laryngitis and bronchitis by brewing the herb into a tea¹. It is also commonly used as a decongestant², an anesthetic³ and is also used to treat gastrointestinal issues³ such as diarrhea. Prior research has also been conducted on the effects of consuming sea lavender to stop pulmonary hemorrhage².



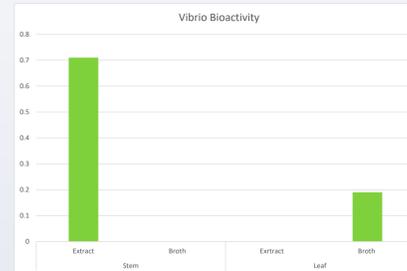
Experimental Design

Sea lavender was collected from Pickman park salt marsh. It was washed a placed on a petri dish. Once growth had occurred, a small sample of the endophyte was taken from the dish and placed onto a new dish, in attempt to grow only the endophyte selected. After a few days, a small sample from that plate was transferred into a vial containing potato dextrose broth. After 4 weeks metabolites were extracted from the broth. Bioactivity was tested on the different endophytes and extracts were run through the LCMS to identify the different compounds within them.

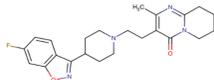
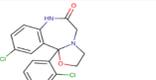
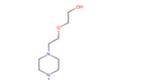
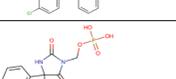
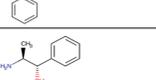


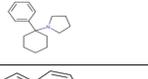
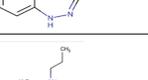
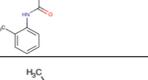
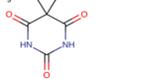
Leaf Sample Bud Sample Stem Sample

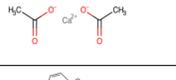
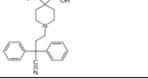
Bioactivity Results

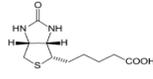


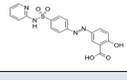
LCMS Results

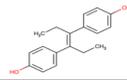
Common Name	Uses	Structure
Risperidone	Used to treat many mental health conditions such as depression, bipolar, and schizophrenia	
Clozapam	Mainly used to treat anxiety, but can also be used to treat depression, schizophrenia, neurosis, and epilepsy. Can also be used as a muscle relaxant	
Hydroxyzine	Used to treat anxiety	
Fosphenytoin	Used to prevent seizures	
Cathine	Used as an appetite suppressant	

Common Name	Uses	Structure
Rolicyclidine	Can be used as a sedative / anesthetic	
Benzodiazepine	Used mostly as a sedative or to treat anxiety	
Prilocane	Used as an anesthetic	
Barbital	Used as a sedative, also has hypnotic affects	

Common Name	Uses	Structure
Calcium Acetate	Used to treat hyperphosphatemia in patients with kidney disease.	
Difenoxin	Used to treat diarrhea	

Common Name	Uses	Structure
Hydroquinone	Mainly used to treat skin conditions such as hyperpigmentation, sunspots, and freckles	
Biotin	Mainly used in cell growth, and is commonly used for nail and hair growth/ strength production of fatty acids, steadies blood sugar	
Crotamiton	Used as a scabicide and for relief of pruritus	

Common Name	Uses	Structure
Sulfasalazine	An anti-inflammatory drug also used to combat ulcerative colitis	

Common Name	Uses	Structure
Diethylstilbestrol	Used in treatment of menopause and menopausal disorders	

Information including images collected from DrugBank Online⁴

Conclusion

After examining the results obtained from the LCMS, there were compounds identified that correlate to the known medicinal uses. These compounds include Difenoxin, which treats diarrhea³, Prilocane and Rolicyclidine which both can be used as an anesthetic² and Sulfasalazine which can be used as an anti-inflammatory drug. The compounds Risperidone, Clozapam, Hydroxyzine, Fosphenytoin, and Cathine were also found in the LCMS data and are known to treat ailments of the Brain / Nervous system. Specifically, there were many compounds known to treat mental illness such as anxiety, depression, and schizophrenia. Other compounds were identified such as Hydroquinone which is used to treat hyperpigmentation and sunspots, Biotin which is commonly used to strengthen hair and nails, and Crotamiton, which is used as a scabicide. The compound Diethylstilbestrol was also found in the data and is commonly used in hormonal treatments having to do specifically with menopause and menopausal disorders. These compounds found are particularly interesting because Limonium has not been known to treat them in the past, suggesting that more research should be done on Limonium's endophytes. The research indicates that it may not be the actual plant that contains these medicines but rather the endophytes inside the plant. This is important because endophytes can be grown quickly in large quantities without the need to take the entire plant to harvest medicinal compounds. All of this suggests that further research should be conducted on the endophytes in sea lavender.

References

1. Vanessa Neves, et al. "Coupling Sea Lavender (*Limonium Algarvense* Erben) and Green Tea (*Camellia Sinensis* (L.) Kuntze) to Produce an Innovative Herbal Beverage with Enhanced Enzymatic Inhibitory Properties." *South African Journal of Botany*, vol. 120, Dec. 2017, pp. 87-94
2. "Medicinal Herbs: Sea Lavender (*Limonium Vulgare*)." *Medicinal Herbs: SEA LAVENDER - Limonium Vulgare*
3. "Lavender, Sea, American." *A Modern Herbal | Lavender, Sea, American*
4. "DrugBank Online: Database for Drug and Drug Target Info." *DrugBank Online | Database for Drug and Drug Target Info*