



Innovation Academy Design Team: Medicinal Plants

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Driving Question

How can we research and study about medicinal plants, and implement innovative strategies to apply our research to the real world, and to our community?

Introduction

Medicinal plants have played a crucial role in human health and well-being for centuries, serving as natural sources of remedies and therapeutic compounds. In today's world, their importance is more pronounced than ever, as the growing demand for alternative and sustainable healthcare solutions drives a newfound interest in traditional medicine. From tackling common ailments to addressing complex disorders, medicinal plants provide a rich variety of biological compounds that continue to innovate modern pharmaceuticals and health practices. For these reasons, our group has decided to explore the techniques and methods used for cultivating medicinal plants at IA and has explored/researched the exact benefits for a wide range of medicinal plants.

Background

One of the backbone organizations that inspired our continued work in this area of environmental sciences is Trees Atlanta. Trees Atlanta is a non-profit organization dedicated to protecting and improving Atlanta's urban forest. Its primary goals include planting new trees, conserving existing trees, and educating the public about the benefits of trees. They also focus on promoting community engagement and environmental stewardship. Through the exploration and volunteering at many of these locations, I was provided with sufficient experience and motivation to plant medicinal herbs in a garden of our own at Innovation Academy, as well as research the uses of a large variety of medicinal plants on my own.

Our Mission

The goal of this project was to research specific medicinal plants, and compile them into a final book, showcasing our group's combined research and involvement in important topics such as medicinal plants. Additionally, our goal was to plant some of these medicinal plants in a garden outside of Innovation Academy for the use of the school itself. Through these processes, our group will be able to contribute to the school and the community in more ways than one: through research of many of these medicinal plants and their specified uses, and through the implementation of these techniques in our community.

Our Work

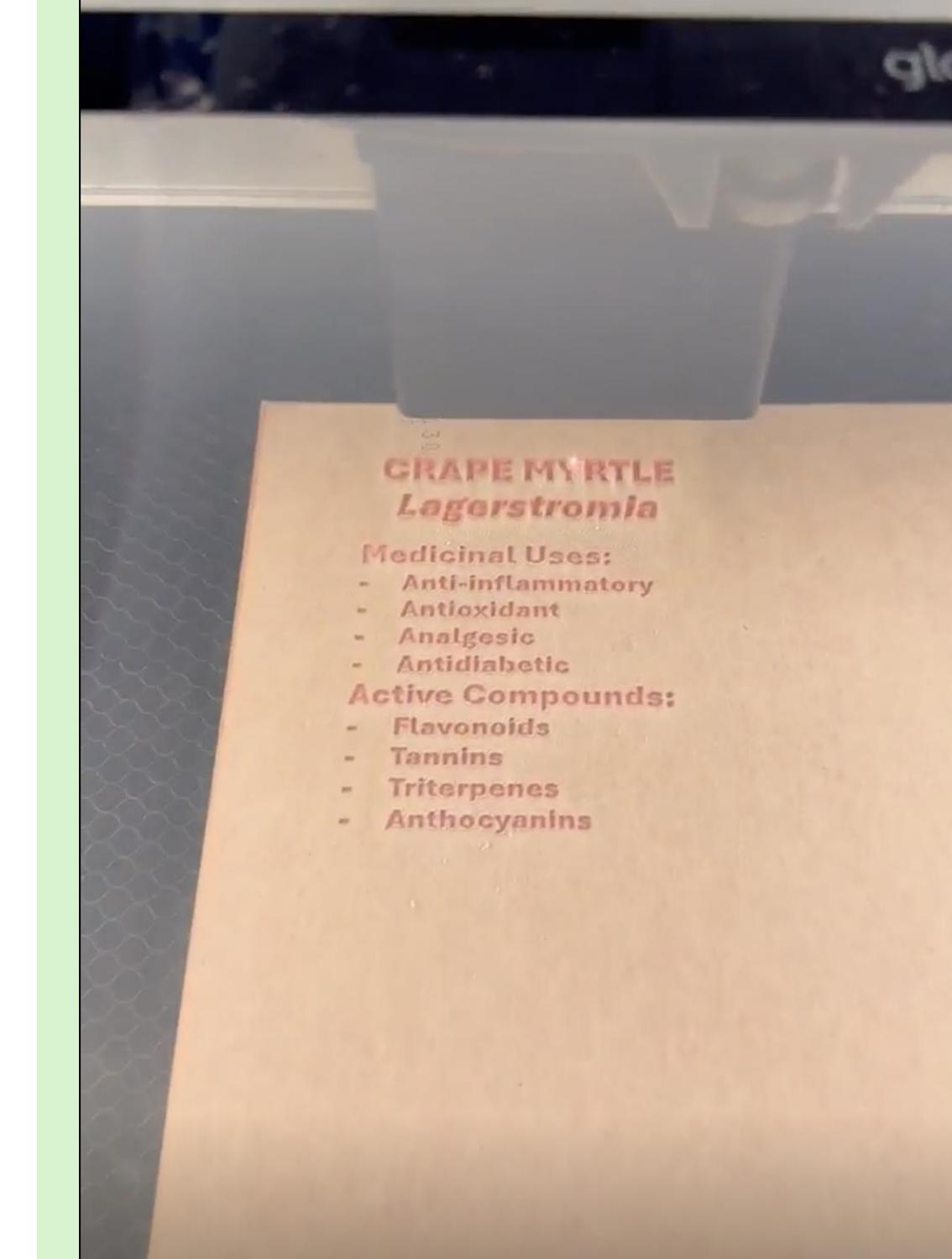
The first section of our project was to create a book using research that we had collected about several medicinal plants, and their medicinal uses, as well as their origin, their hardness zones, life cycle, and methods of use. The plants that were used for this book include American beautyberry, Black Cherry, Lemon Balm, American Sweetgum, Nightshade, Charlotte Rose, Echinacea purpurea, Black Hawthorn, Crepe Myrtle, Elderberry, Turmeric, Lavender, Hibiscus, Catnip, Dogwood, Yarrow, Yellow Root, Peppermint, Plantain, Elecampane, Aloe Vera, Tulsi, Passion Fruit, Oregano, Chives, Red Clover, American Ginseng, Black Cohosh, Chamomile, and Common Poppy. The plants listed possess a wide range of medicinal properties, reflecting their historical significance in the healthcare sector. Many of these plants, like Echinacea purpurea, Turmeric, and Chamomile, are renowned for their anti-inflammatory and immune-boosting effects, making them valuable in managing colds, infections, and chronic inflammation. Herbs such as Peppermint and Lemon Balm are commonly used for digestive health, offering relief from nausea, bloating, and indigestion, while Lavender and Catnip are celebrated for their calming effects on the nervous system, aiding in stress relief and sleep disorders. Other plants such as Tulsi, Red Clover, and Oregano are multipurpose, with antimicrobial, detoxifying, and anti-inflammatory properties. These plants were used across different cultures over a wide span of history, and by researching these medicinal purposes, we are making these practices known in our community.

The next section of our project was to plant medicinal plants in the garden outside of IA. This garden was vacant for a long period of time, so our team decided to plant different types of blueberry plants. Planting medicinal blueberries, one such being *Vaccinium*, in this garden offers numerous benefits for both health and the environment. Blueberries are rich in antioxidants, particularly anthocyanins, which help combat oxidative stress, reduce inflammation, and support heart health. They are also linked to improving brain function and lowering the risk of chronic diseases like diabetes and certain cancers. From a gardening perspective, blueberry plants are relatively low-maintenance and can thrive in a variety of climates, making them an excellent addition to all gardens. Additionally, they enhance biodiversity by attracting pollinators such as bees and butterflies, ensuring proper ecosystem flow. By keeping many of these characteristics in mind, our design team successfully planted 4 different types of blueberry plants, each one grown in moist soil, without the use of pesticides or other additional herbicides. This proved to be a valuable experience for all and allowed us to truly make a difference in our community through small, yet influential actions.

Our final goal for our design team was to engineer plaques for these blueberry plants that we had created, as well as for the trees and other plants that were already present outside. Rather than truly affecting the environment, this part of the project was aimed at attracting attention to IA's garden and informing the public about many of the different plants that were located outside of our school. To complete this design, we engineered a solid orange, transparent, plastic-like base that would act as a plaque that could be mounted onto the wall of the planters or planted into the ground using a short rod/pole. To convey information about the plant the plaque was covering, our team used a laser engraver (Glowforge) to engrave both the common name, scientific name, and medicinal properties and uses of the trees/plants outside. These engravings were then spray painted properly to allow viewers to read it from afar. One example would be the Crepe Myrtle, which was planted around the garden many years ago. To attract attention to these plants, and to inform the public about this tree's properties, we designed a plaque and mounted it next to the tree, highlighting the tree's medicinal uses (anti-inflammatory, antioxidant, analgesic, antidiabetic), as well as the compounds located inside the tree (flavonoids, tannins, triterpenes, and anthocyanins). By taking these measures, and adding these plaques to our community, we are informing our community about the beneficial uses of several different medicinal plants that many may look over on a daily basis.



Method + Results



Future Prospects

Though our time completing many of these tasks was short, our design team has several long-term plans put in place to further our service to the community and inform others about many of these medicinal plants that we have introduced into our community.

1. Expanding our garden and expanding the types of plants that we are establishing into garden beds near IA, and eventually across the Alpharetta community. Through support from the city of Alpharetta, our goal for the coming years will be to plant medicinal plants across downtown Alpharetta, which will be extremely effective as this area is brimming with people on the streets. By creating and adding information plaques near these medicinal plants, we can educate the public about the natural remedies available in their environment. This can foster awareness of traditional and alternative medicine and inspires people to explore more sustainable health practices.
2. Collaborating with Trees Atlanta to promote the growth of plants across our community, and aid in the planting of more medicinal plants in our community. By reaching out to large organizations such as Trees Atlanta, our design team will be able to have better access to large spaces and territories for plant growth and restoration, allowing us to have a larger influence on the spread of information surrounding medicinal plants.
3. Finally, we plan on lengthening our book on medicinal plants as to incorporate 200+ varieties of medicinal plants that are available in North America. We plan on improving research on the exact medicinal uses of specific plants yet also focusing on information surrounding invasive species. Invasive species such as the Chinese Privet or the Tree of Heaven (*Ailanthus altissima*) are of great importance and are sectors of our research that we plan on implementing into newer versions of our book. This will ensure that the community is informed on a plethora of biological concepts pertaining to our community and environment.

Acknowledgements

Thank you to Mr. Robinson for sponsoring this Design Team, and allowing for the planting of these medicinal plants, and for giving us access to resources such as the laser printer, which proved to be incredibly effective in our project. Additionally, I acknowledge the rest of my teammates who were apart of this team, and who worked diligently alongside me to plant many of these medicinal plants and create plaques.