

The Apothecary’s Garden: the Plants Behind Modern Medicines

Many of the medications used in modern healthcare are adaptations of early botanical remedies, a fact often unrecognized by the providers and patients using them. The Apothecary’s Garden seeks to share and celebrate some of these ethnobotanical origin stories through a series of watercolor paintings.

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01. Introduction

Many pharmaceutical remedies trace their origins hundreds or even thousands of years ago in history, back to fields and forests across the world. Despite this, patients and physicians are often unaware of the rich ethnobotanical origins of the medications they use every day.

The Apothecary’s Garden seeks to bridge this gap, and is an artistic exploration of the plants from which the active ingredients of many modern-day medicines were first isolated. The project attempts to identify & share the ethnobotanical origins of the selected medications (while simultaneously providing an opportunity for reflection and mindfulness during medical school by way of artistic pursuit) by combining watercolor illustrations of selected plants which gave rise to common medications with written descriptions exploring the historical and modern applications of these plants to healthcare.



Fig. 1. *Taxus brevifolia*, also known as Pacific yew; source of taxane, the main compound in the chemotherapy drug, paclitaxel

03. Methodology

First, an extensive list of medications with botanical origins was identified. From this, specific examples were selected with emphasis placed on medications with significant pharmaceutical or toxicological importance to the specialty of emergency medicine. Further literature review was then performed for each selected species using PubMed, and information such as distribution, historical and modern applications, components of pharmaceutical importance, and associated toxidromes for each plant was synthesized into laymen’s descriptions. These summaries were published alongside the watercolor illustrations on a Google-website.

At the same time, watercolor portraits of each species were created using photographs and botanical illustrations sourced online as references. Each portrait was built by layering multiple “washes” of watercolor pigment until the desired color, richness and depth were achieved. This process involved multiple paintings for each species, as the artist-author worked to find the combination of pigments that would create the most accurate depiction of each plant. Additionally, because each layer must dry completely before the next can be applied, a single portrait may take as long as 12 hours to create from start to finish.

04. Results

Eight botanical species, each the progenitor of a modern medicine, were represented in this project (listed below). In addition to a watercolor rendition of each plant, a detailed summary of the ethnobotanical history for each species was described.

- *Ammi visnaga* (amiodarone)
- *Atropa belladonna* (atropine)
- *Colchicum autumnale* (colchicine)
- *Datura stramonium* (scopolamine)
- *Digitalis purpurea* (digoxin)
- *Papaver somniferum* (codeine, morphine, oxycodone)
- *Salix alba* (aspirin)
- *Taxus brevifolia* (taxol)

The published website with all plant portraits & descriptions can be found by scanning this QR code:



Fig. 3. *Papaver somniferum*, also known as opium poppy; progenitor of analgesics such as opium, codeine and morphine

02. Background

The art of botanical illustration for scientific purposes dates to the 1st century BCE, when it was pioneered by Krateus, a Greek physician and artist now known as the “father of botanical illustration.” Krateus’ significant works included a collection of annotated illustrations reflecting plants and their associated medicinal uses, published as *Rhizotomica*, which was intended to help healthcare providers correctly identify, process and apply herbs for medicinal purposes. He later published a similar series aimed at the education of the layperson. Though Krateus’ original works no longer exist, many herbal compendiums believed to include replications of these early illustrations have survived the centuries.



Fig 2. An illustration of *Plantago lanceolata* (plantain), believed to be a copy of one of Krateus’ original works.

05. Discussion

Though often overlooked, there is a rich history behind many common medications. The examples selected for this project represent only a small portion of that history, focusing on medications which are often used in the emergency department or with recognizable toxidromes seen in ER visits. Interestingly, the names of these medications or those of the chemical compounds they are formulated from often provide subtle nods to their botanical progenitors. In researching and reviving these histories, the artist-author discovered a deeper sense of connection to each plant and its evolution into pill form, gained better understanding of the medicinal and toxicological properties of the medications they’ve given rise to, and re-sparked a sense of curiosity to continue exploring the ethnobotanical origins of Western medicine.

Additionally, the artistic portion of this project, provided an interesting opportunity to slow the often hectic pace of medical school activities and gave the artist-author time to contemplate the histories and context of each botanical species while she worked. By intermingling literature reviews with the slowly-paced painting process, the artist-author was forced to slow down and focus on the details of each plant, gaining a structured time away from general studies to focus on mindfulness, deliberation, and calm. In summary, this project has built for the author not only an interest in further exploring the topic of ethnobotany, but also an appreciation for the value of building intentional space for art and reflection into the otherwise hectic atmosphere of medical learning.

Selected References

Helmenstine, A. (2024, July 16). List of Medicines Made From Plants. ThoughtCo. <https://www.thoughtco.com/drugs-and-medicine-made-from-plants-608413>.

Hummer, K. (2024, August). The Apothecary’s Garden. Google. <https://www.sites.google.com/view/theapothecarysgarden>.

Lauterjung, I. (2021, September 3). Botanical Illustration. Heritage. <https://www.rcpe.ac.uk/heritage/botanical-illustration>

Pojar, J., & MacKinnon, A. (Eds.). (2004). Western Yew/Pacific Yew - *Taxus brevifolia*. In Revised Plants of the Pacific Northwest Coast Washington, Oregon, British Columbia & Alaska (p. 40). essay, Lone Pine Publishing.

Mahr, S. (2017, June 12). Breadseed or Opium Poppy, *Papaver somniferum*. Wisconsin Master Gardener. https://mastergardener.extension.wisc.edu/files/2017/06/Papaver_somniferum.pdf

Nižnanský, L., Osinová, D., Kuruc, R., Hengerics Szabó, A., Szórádová, A., Masár, M., & Nižnanská, Ž. (2022). Natural Taxanes: From Plant Composition to Human Pharmacology and Toxicity. International journal of molecular sciences, 23(24), 15619. <https://doi.org/10.3390/ijms232415619>

DISCLOSURES

None