

The
Garden
Apothecary



About This Project

In Europe, a mere three hundred years ago, botany was a required subject for medical students, since plants were still the main source of medicine. In our complex society today, most people don't have knowledge of the botanical origins of the plant-based items we use every day, including food items, clothing and building materials, and medicines.

Students in Plants, Food, and Medicine (BIOL 315) sought to bridge this knowledge gap by researching the medicinal properties of plants in the University of St. Thomas Medicinal Garden. These plants have been in use for hundreds of years as treatments for common ailments. Sarah Nelson, the Sustainable Communities Partnership Artist-in-Residence, illustrated each plant in the style of old botanical prints, made customized icons, and assembled the information into this booklet. We hope that the Garden Apothecary helps you to see plants in a new light.



The University of St. Thomas Medicinal Garden was created in 2017 as a collaborative effort between members of the Biology and Facilities Departments. Greenhouse Manager Catherine Grant designed the garden at the request of Dr. Amy Verhoeven as a space that could become an outdoor lab for Plants, Food, and Medicine (BIOL 315). It was modeled after a medieval walled garden, with four beds, each containing plants that represent four types of medicinals: Native American, modern pharmaceuticals, traditional European medicinals, and modern herbal supplements. The garden is now open to visitors as a place to learn about the connection between plants and medicine and also as a quiet, contemplative space.

The University of St. Thomas Sustainable Communities Partnership (SCP) collaborates with government and campus partners to integrate projects important to partners into St. Thomas courses across disciplines. Students apply course content to advance partners' sustainability goals and improve interconnected human and ecological well-being in the Twin Cities area. Through the SCP Arts initiative, students collaborate with local artists to translate their SCP project findings into original artwork. SCP partners share the resulting artwork in their communities and beyond, bringing to life sustainability goals for people of all ages.



Important Notice

You should not take action based on information in this publication without first consulting a healthcare professional.

The information in this publication is for educational purposes only. It is not medical advice or a substitute for advice from a physician, pharmacist, or other healthcare provider.

The statements about specific herbs in this publication have not been evaluated by the U.S. Food and Drug Administration (FDA). The statements are not intended to diagnose, treat, cure, or prevent any disease.

Medicinal plants contain chemical compounds that can be toxic. Herbs and herbal preparations may cause adverse reactions on their own, or when they interact with other herbs, prescription drugs, food, alcohol, or other substances. These risks may be heightened for infants, children, the elderly, and those who are pregnant or nursing.

Your use of, or reliance on, information in this publication is solely at your own risk.



Icon Glossary: AILMENTS



ANXIETY,
STRESS +
DEPRESSION



ARTHRITIS +
RHEUMATISM



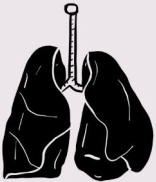
COUGH,
COLDS +
RESPIRATORY



SKIN
DISORDERS



ANTI-INFLAMMATORY
+ PAIN RELIEF



ASTHMA



DIGESTIVE
DISORDERS



WOUND CARE

Icon Glossary: PREPARATION TYPES



ESSENTIAL OIL

the natural oil usually gathered through distillation and carrying the fragrance of the plant it is extracted from



TEA

a drink infused with dried crushed leaves, roots, or flowers using boiling water



CREAM

a thick liquid used for topical cosmetic or medicinal purposes



TINCTURE

a medicine created by dissolving a drug in alcohol



POULTICE

a moist mass of plant material or flour applied to the body to address ailments



ELIXIR

a medicinal liquid concoction usually containing alcohol and a sweetener



TOXICITY WARNING

warning that these plants are known to contain toxins



LAVENDER

Lavandula angustifolia

AILMENT: ANXIETY, STRESS, DEPRESSION

GEOGRAPHIC ORIGIN: Mediterranean Region

PARTS USED: Dried or fresh flowers, buds, and leaves

USES: Anxiety, stress, insomnia, and depression

PREPARATION: Essential Oil can be taken orally or in aromatherapy

CHEMICALS OF INTEREST: Linalool

Botanical Trivia

- * In Ancient Rome, lavender was used in medicinal baths and in Ancient Egypt as a perfume and for mummification.
- * It is said that Cleopatra used the fragrance of lavender in her grand seductions and that the asp that killed her hid among her lavender bushes.



LINALOOL



AILMENT: ANXIETY, STRESS, DEPRESSION

GEOGRAPHIC ORIGIN: Eurasia

PARTS USED: Root + rhizome

USES: Anxiety, depression, insomnia, and menstrual cramps

PREPARATION: The rhizome is dried and made into a tea or used in capsule form.

CHEMICALS OF INTEREST: Valerenic Acid

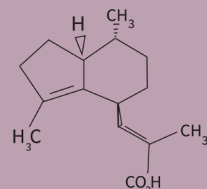
Botanical Trivia

✧ In Ancient Greece, valerian root was used to treat nausea, flatulence, urinary tract infections and insomnia. In the Middle Ages, it was used as a diuretic and in the treatment of epilepsy.

✧ Valerian was often prescribed during World War II as a method of relieving stress caused by air raids.



VALERENIC ACID





VALERIAN
Valeriana officinalis



SAINT JOHN'S WORT

Hypericum perforatum

AILMENT: ANXIETY, STRESS, DEPRESSION

GEOGRAPHIC ORIGIN: Eurasia

PARTS USED: Flower buds

USES: Depression + mood disorders

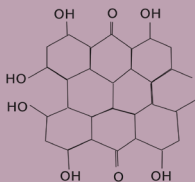
PREPARATION: Tea, capsules, and oil based skin lotion

CHEMICALS OF INTEREST: Hypericin and hyperforin

Botanical Trivia

- * This flower is named after St. John the Baptist because it blooms around his birth date, in late June.
- * St. John's Wort was used as a magic potion during the Middle Ages, and was often used to protect humans and animals against witches, demons and evil diseases.
- * When St. John's Wort is ready for harvest, the flower buds will secrete a red substance when crushed, resembling blood.

HYPERICIN



AILMENT: ARTHRITIS + RHEUMATISM

GEOGRAPHIC ORIGIN: South America

PARTS USED: Fruit (Pepper)

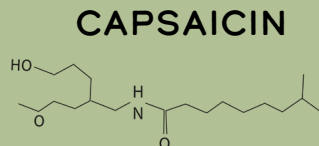
USES: Relieves swelling + pain from rheumatoid arthritis

PREPARATION: Cream is applied topically to skin

CHEMICALS OF INTEREST: Capsaicin

Botanical Trivia

- * Chile peppers originated in the wild in Bolivia. Five species were domesticated by 3300 BCE, the same five that we currently use.
- * Peppers were integral to the cultures and cuisines of the Inca, Mayan, and Aztec, where they were valued as a spice, a fruit, currency, medicine, and as a holy plant woven into their mythology.
- * Chile peppers were quickly adopted worldwide after trade routes were opened up between the Old World and the New World. By the 1500s chile peppers had spread via these routes to Europe, Africa, and India and became essential to many cuisines far from their origin in South America.





CAYENNE PEPPER

Capsicum annuum



GARLIC
Allium sativum

AILMENT: ARTHRITIS + RHEUMATISM

GEOGRAPHIC ORIGIN: Central Asia + the Middle East

PARTS USED: Fresh bulb or cloves

USES: Anti-inflammatory, managing cholesterol and diabetes, antifungal

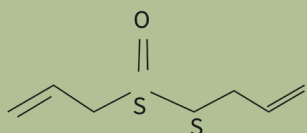
PREPARATION: Made into poultice or into steam-distilled oil to massage topically over affected areas

CHEMICALS OF INTEREST: Allicin

Botanical Trivia

- * Pressing garlic releases the enzyme alliinase, forming the sulfur compound allicin, which is responsible for garlic's complex flavor.
- * Garlic was in use at the start of recorded history and was found in Egyptian pyramids and Greek temples.
- * In Eastern European folklore, garlic not only wards off disease but also evil spirits, including vampires.

ALLICIN



AILMENT: ARTHRITIS + RHEUMATISM

GEOGRAPHIC ORIGIN: Persia (Iran)

PARTS USED: Fruit (rosehips) + petals

USES: Anti-arthritic, anti-inflammatory, antioxidant

PREPARATION: Can be eaten raw or formed into an extract powder, syrup or tea

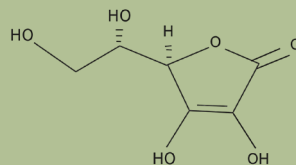
CHEMICALS OF INTEREST: Galactolipids (Vitamin C)

Botanical Trivia

- * Rosehip tea contains more vitamin C than oranges.
- * In Ancient Rome, people consumed rose petals as food, and marinated them in wine to cure hangovers.
- * Knights returning from the Crusades brought the apothecary rose to Europe where it was initially grown in monastic medicinal gardens.
- * During the Napoleonic era, French pharmacists/apothecaries grew roses in pots at the entrances to their shops, thus leading to the common name "Apothecary Rose".



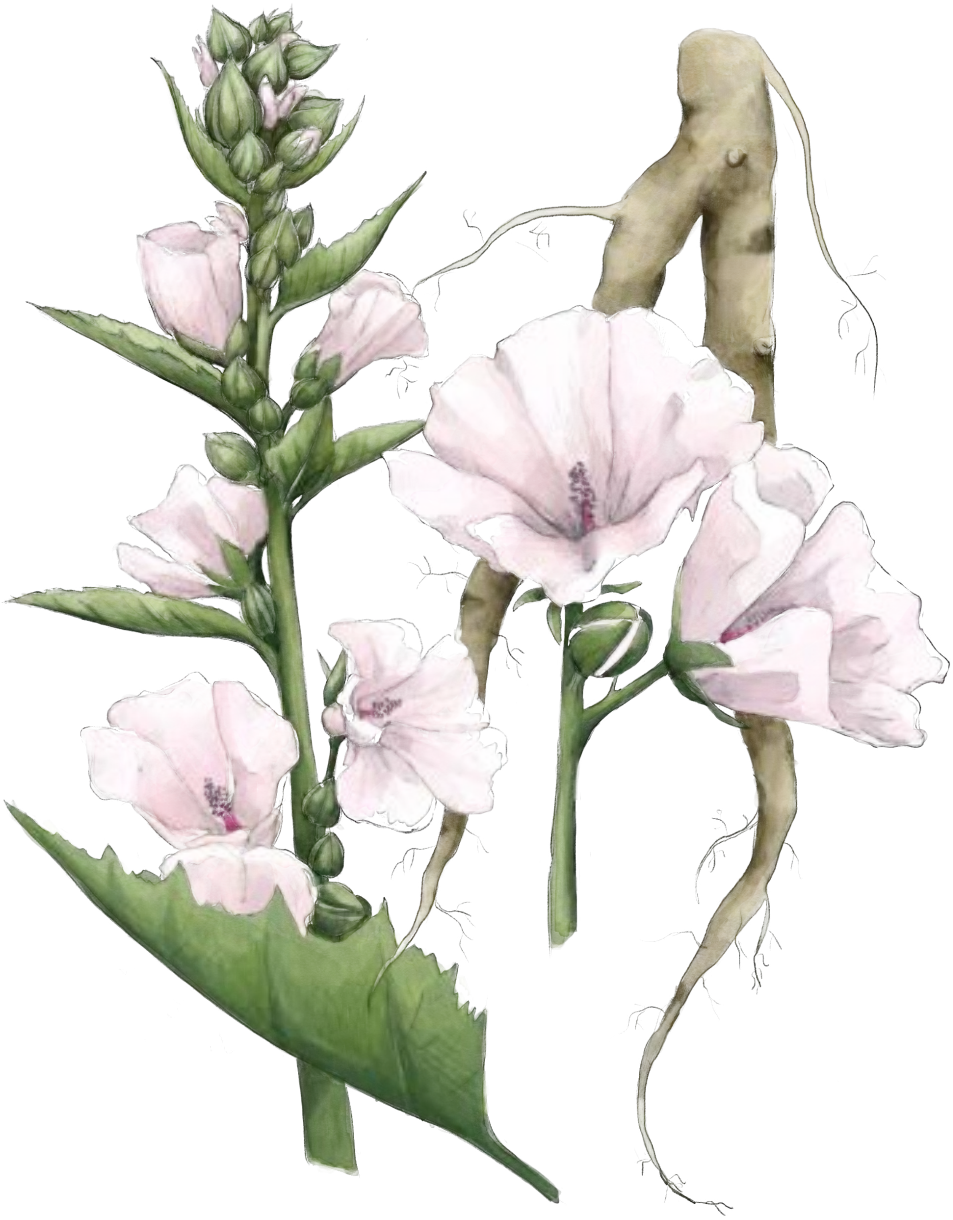
GALACTOLIPIDS





APOTHECARY ROSE

Rosa gallica



MARSHMALLOW

Althea officinalis

AILMENT: COUGHS, COLDS, RESPIRATORY

GEOGRAPHIC ORIGIN: Eurasia + Mediterranean

PARTS USED: Root

USES: Respiratory, digestive, and skin conditions

PREPARATION: The root can be made into a tea, lozenges, a syrup extract, and can be candied or pickled.

CHEMICALS OF INTEREST: Polysaccharide with mucilage properties

Botanical Trivia

- * The marshmallow confection treat was originally made with extract from marshmallow root.
- * All parts of the marshmallow plant are edible, but it is the mucilage from the root that is most important for its cough suppressant and throat-soothing properties.
- * Egyptians were the first people to make a medicinal product from the roots, mixed with honey and spices.
- * The Roman physician, Pliny, was a champion of marshmallow, writing, “.. whosoever shall take a spoonful of the mallows shall that day be free of diseases that may come unto him.”



AILMENT: COUGHS, COLDS, RESPIRATORY

GEOGRAPHIC ORIGIN: Eurasia

PARTS USED: Leaves, oils

USES: Sore throat, bronchitis, cough, and upset stomach

PREPARATION: Essential oil, leaves added to food

CHEMICALS OF INTEREST: Thymol

Botanical Trivia

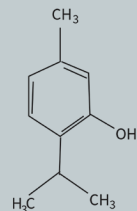
* Thyme was used by the ancient Egyptians to soften skin, to combat body odor, for its antibacterial properties, and for mummification. They equated its pleasant smell with holiness.

* There are over 300 different varieties of thyme, all with slightly different flavors and scents.

* Thymol is used in mouthwashes, soaps, and deodorants, for its antibacterial and antifungal properties.



THYMOL





THYME
Thymus vulgaris



PURPLE CONEFLOWER

Echinacea purpurea

AILMENT: COUGHS, COLDS, RESPIRATORY

GEOGRAPHIC ORIGIN: North America

PARTS USED: Roots + aerial parts of plant

USES: Common cold, flu, and other respiratory ailments

PREPARATION: Dried roots are used in extracts, expressed juices or tinctures. Shoots can also be used to make extracts.

CHEMICALS OF INTEREST: Alkamides, caffeic acid derivatives, polysaccharides

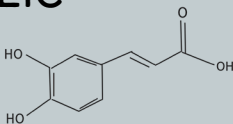
Botanical Trivia

* *Echinacea* was a very popular supplement in the 1990s as a treatment for colds. However, several studies conducted since then have shown that there was no difference in the symptom relief between participants who received the placebo versus the *Echinacea* treatment.

* Native Americans used the juice extracted from the roots to treat toothache, smallpox, sore throat, and snake bites. The preparations were also used to make offerings during rituals.

* *Echinacea* was nicknamed the “Thirst Plant” by pioneers who found that eating the roots helped reduce thirst when water was scarce.

CAFFEIC ACID



AILMENT: SKIN DISORDERS

GEOGRAPHIC ORIGIN: Eurasia

PARTS USED: Root

USES: Anti-inflammatory, antibacterial for wound-healing and ulcers

PREPARATION: The root is dried and prepared into tinctures, ointments, and capsules.

CHEMICALS OF INTEREST: Glycyrrhizin

Botanical Trivia

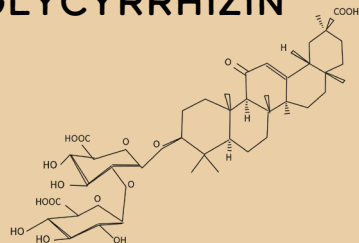
* Theophrastus, a Greek botanist, referred to licorice as “sweet root”.

* In Traditional Chinese Medicine, it is said that “...nine out of ten formulas contain licorice”. The plant has been used there for thousands of years and still plays a role in modern pharmacology.

* Modern licorice candy evolved from its use as throat lozenges.



GLYCYRRHIZIN





LICORICE
Glycyrrhiza glabra



EVENING PRIMROSE

Oenothera biennis

AILMENT: SKIN DISORDERS

GEOGRAPHIC ORIGIN: North America

PARTS USED: Seeds

USES: Eczema

PREPARATION: Seeds can be eaten or pressed for oil.

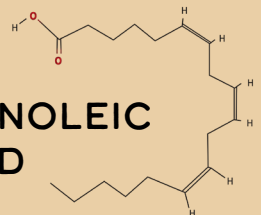
CHEMICALS OF INTEREST: Gammalinoleic acid

Botanical Trivia

- * Native Americans used Evening Primrose for wound care, stomach pain, and sore throats.
- * In 17th century Europe, it was called the “King’s Cure-all” and was popular for treating wounds, skin conditions, and headaches.
- * Clinical studies have shown improvement in atopic dermatitis after 4 weeks of daily consumption of 500-1000 mg of primrose oil.



**GAMMALINOLEIC
ACID**



AILMENT: PAIN RELIEF, ANTI-INFLAMMATORY

GEOGRAPHIC ORIGIN: Asia

PARTS USED: Leaves, stems, and flowers

USES: Pain relief, anti-inflammatory, and antimalarial

PREPARATION: Essential oil + tea

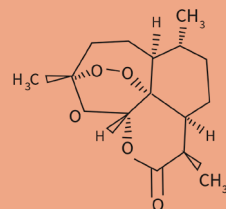
CHEMICALS OF INTEREST: Artemisinin

Botanical Trivia

- * The genus name *Artemisia* is in honor of the Greek goddess Artemis, and Queen Artemisia II of Caria, a botanist in the 4th century BCE.
- * Chinese emperor Shen-Nung is said to have discovered that sweet wormwood cures malaria. More recently, a Chinese professor Youyou Tu was awarded the 2015 Nobel Prize for discovering artemisinin and its use as an antimalarial drug.
- * Sweet wormwood used to be an ingredient in vermouth made in Europe- but it is no longer used due to potential psychoactivity and toxic effects.



ARTEMISININ





SWEET WORMWOOD

Artemisia annua



OPIUM POPPY

Papaver somniferum

AILMENT: PAIN RELIEF, ANTI-INFLAMMATORY

GEOGRAPHIC ORIGIN: Mediterranean Region

PARTS USED: Opium latex from seed pods

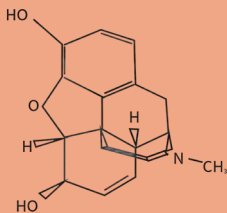
USES: Pain relief, asthma, and cough

PREPARATION: Tea + latex

CHEMICALS OF INTEREST: Morphine + other alkaloids

Botanical Trivia

- * Opium poppy was cultivated in lower Mesopotamia prior to 3000 BCE.
- * Sumerians referred to it as “hul gil” or the “joy plant”.
- * Opium is the dried latex from the poppy seed pod.
- * The cultivation and trade of opium has had enormous socioeconomic impacts throughout history, ranging from the Opium Wars between China and the British Empire to the current opioid crisis in the United States.



MORPHINE



AILMENT: PAIN RELIEF, ANTI-INFLAMMATORY

GEOGRAPHIC ORIGIN: North America + East Asia

PARTS USED: Root + fruit

USES: Back pain, earaches, skin disease, and cough

PREPARATION: Tea can be used for coughs and a poultice made from the roots and fruits can be used topically for burns, other skin ailments, and inflammation.

CHEMICALS OF INTEREST: Volatile oils, resins, and tannins

Botanical Trivia

- * Native Americans used an infusion of roots and berries to treat a variety of ailments including coughs, colds, sore throats, menstrual pain, tuberculosis, wounds, swollen muscles, and infections.
- * The root has a licorice-like flavor and can be substituted for sarsaparilla when making root beer. Roots are harvested in late summer and early fall and dried before use.
- * The red berries can be eaten raw or made into jelly.





AMERICAN SPIKENARD

Aralia racemosa



CASTOR BEAN

Ricinus communis

AILMENT: PAIN RELIEF, ANTI-INFLAMMATORY

GEOGRAPHIC ORIGIN: East Africa

PARTS USED: Seeds

USES: Anti-inflammatory, arthritis pain, and wound-healing

PREPARATION: Oil extracted from seeds can be applied to skin for pain and inflammation. All other parts of this plant are toxic!

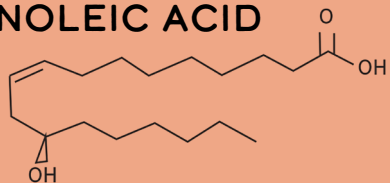
CHEMICALS OF INTEREST: Monosaturated fatty acids such as ricinoleic acid, ricin

Botanical Trivia

- * Egyptians used Castor oil in 4000 BC for lamp oil, ointments, beauty products, laxatives and arthritis. Cleopatra was said to use it to brighten the whites of her eyes.
- * Castor oil is used to lubricate motors and lent its name to Castrol Motor Oil.
- * The castor bean plant contains ricin, a dangerous toxin, famously used during the Cold War by an assassin to kill a Bulgarian writer and anti-Communist activist, Georgi Markov. The assassin jabbed Markov with a ricin-laced umbrella tip while he was waiting at a bus stop. He died three days later.



RICINOLEIC ACID



AILMENT: ASTHMA

GEOGRAPHIC ORIGIN: Mediterranean Region

PARTS USED: Leaves, stems, and flowers

USES: Asthma, inflammation, pain relief, insomnia, and anxiety

PREPARATION: Essential oil + tea

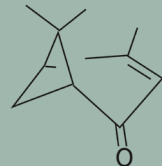
CHEMICALS OF INTEREST: Verbenene

Botanical Trivia

- * In Egyptian mythology, vervain was considered sacred to the goddess Isis. According to legend, when she cried, vervain would grow where her tears touched the earth.
- * Verbena is derived from the Latin meaning “altar plant” due to its status as a sacred plant used to decorate altars.
- * Vervain was one of the seven sacred herbs of the Druids in Ireland.
- * More recently, vervain made an appearance in the show *Vampire Diaries*, in which it was prepared as a concoction to injure vampires and protect non-vampires from mind control.



VERBENENE





VERVAIN

Verbena officinalis



JIMSOM WEED

Datura stramonium

AILMENT: ASTHMA

GEOGRAPHIC ORIGIN: Central + South America

PARTS USED: Leaves

USES: Asthma, cough, fever, and skin disorder

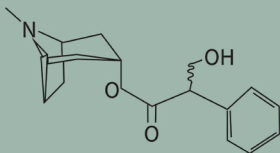
PREPARATION: Leaves are dried then smoked, or made into a poultice for topical application

CHEMICALS OF INTEREST: Atropine

Botanical Trivia

- * Eastern Cherokee used the smoke from Datura leaves to treat asthma attacks.
- * A recent study showed that “anti-asthmatic” cigarettes made from Datura leaves may promote bronchodilation and be an effective treatment for asthma.
- * The use of Datura was adopted by people in India, and the small thorn apple of the plant is given as an offering to Shiva in temples on festival days.
- * This plant contains toxic alkaloids, and the the use of it for medical purposes has been very limited.

ATROPINE



AILMENT: DIGESTIVE DISORDERS

GEOGRAPHIC ORIGIN: Eurasia

PARTS USED: Flowers (picked just before opening up)

USES: Nausea, gas, anxiety, cough, and anti-inflammatory

PREPARATION: Essential oil + tea

CHEMICALS OF INTEREST: Apigenin

Botanical Trivia

- * Chamomile was highly prized in Ancient Egypt where it was associated with the sun god Ra. It was valued as a cure-all for many ailments and used in beauty regimes by Egyptian nobility.
- * The ancient Anglo-Saxons found chamomile to be so useful that they believed the herb to be sacred.
- * In the Middle Ages, Europeans used the apple-scented chamomile as a “strewing herb” to repel ticks, mosquitos, and flies when scattered on floors.
- * Chamomile is currently the top-selling herbal tea in the United States.



APIGENIN





CHAMOMILE

Matricaria recutita



PEPPERMINT

Mentha x piperita

AILMENT: DIGESTIVE DISORDERS

GEOGRAPHIC ORIGIN: Eurasia

PARTS USED: Leaves

USES: Intestinal disorders + headache

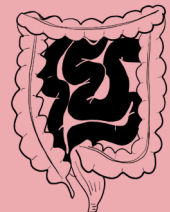
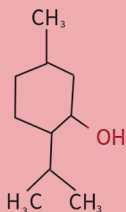
PREPARATION: Essential oil + tea

CHEMICALS OF INTEREST: Menthol, methyl salicylate

Botanical Trivia

- * Peppermint speeds up the digestive process by stimulating the gastric lining.
- * After-dinner mints are not just to freshen breath, but to aid in digestion as well.
- * The Romans believed that eating mint would increase intelligence and help people control their tempers~ so royal ambassadors carried mint sprigs in their pockets in case of outbursts.

MENTHOL



AILMENT: DIGESTIVE DISORDERS

GEOGRAPHIC ORIGIN: Eurasia

PARTS USED: Flower

USES: Upset stomach, ulcers, colds, and joint disorders

PREPARATION: Tea, drink, and elixir

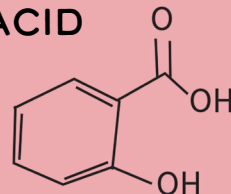
CHEMICALS OF INTEREST: Salicylic acid (Aspirin)

Botanical Trivia

- * The chemicals in meadowsweet coat the lining of the gut to protect it and reduce acidity and inflammation.
- * Meadowsweet can inhibit the growth of *Helicobacter pylori*, a bacterium that causes gastric ulcers.
- * Meadowsweet was a common plant in the medieval period and found its way into literature in Chaucer's "The Knight's Tale" where it is referred to as "meadwort" and used to flavor a drink of honeyed ale.
- * Celtic Druid priests considered Meadowsweet a sacred herb. It was used for love potions, and in bridal bouquets to attract love, peace, and happiness.



SALICYLIC ACID





MEADOWSWEET

Filipendula ulmaria



GOLDENSEAL

Hydrastis canadensis

AILMENT: DIGESTIVE DISORDERS

GEOGRAPHIC ORIGIN: Eastern North America

PARTS USED: Dried or powdered root

USES: Digestive disorders, cold, urinary tract infections, and cancer

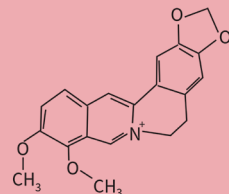
PREPARATION: Tea, herbal extracts, capsules

CHEMICALS OF INTEREST: Berberine

Botanical Trivia

- * Berberine has anti-inflammatory properties and is used to treat *H. pylori* bacterium that causes gastric ulcers.
- * Native Americans used goldenseal for treating ulcers, digestive disorders, fevers, earaches and sore eyes.
- * There is a popular misconception that goldenseal can be used to mask illegal drugs during urine tests. In fact, berberine inhibits enzymes that break down the drug.

BERBERINE



AILMENT: WOUND CARE

GEOGRAPHIC ORIGIN: Eurasia

PARTS USED: Leaves, roots

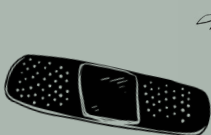
USES: Topical treatment of pain, inflammation, and wound care

PREPARATION: Ointments, creams, poultice, made from leaves and roots and applied topically. Comfrey is not safe to consume orally and has been banned by the FDA for such uses.

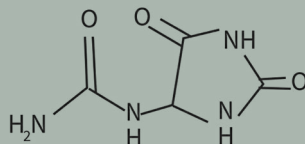
CHEMICALS OF INTEREST: Allantoin

Botanical Trivia

- * The species name *Symphytum* derives from Greek, meaning “to make firm or unite” or “to grow together” referring to its use in healing broken bones.
- * Comfrey’s ancient use is documented by Pliny the Elder in the “*Naturalis Historia*” (77 CE) in which it is mentioned as a treatment for bruises, sprains and wounds.



ALLANTOIN





COMFREY
Symphytum officinale



YARROW
Achillea millefolium

AILMENT: WOUND CARE

GEOGRAPHIC ORIGIN: Eurasia + North America

PARTS USED: Leaves (collected while plant is in flower)

USES: Wound care, fever, and headaches

PREPARATION: Tea + poultice

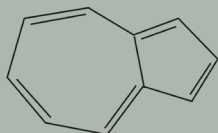
CHEMICALS OF INTEREST: Azulene, caryophyllene, eucalyptol, pinene, and borneol

Botanical Trivia

* Yarrow's botanical name, *Achillea*, refers to Achilles, hero of the Trojan war, who used yarrow to treat the wounds of his soldiers. It was also called "*herba militaris*" due to its usefulness on the battlefield.

* Evidence of yarrow was discovered in a Neanderthal burial site, dated to 50,000 years ago, hinting at its long history as a medicinal plant.

AZULENE





Acknowledgements

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Amy Verhoeven, Biology Professor

Catherine Grant, Biology Greenhouse Manager + Co-Founder of the St. Thomas Medicinal Garden

Sarah Nelson, Sustainable Communities Partnership Artist-in-Residence, @sarah_ann_nelson

Maria Dahmus, Director, Sustainable Communities Partnership



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