

Pharmaceutical Benefits of some Natural Dietary Metabolites

Herbal Medicine

- An herb is a plant or plant part used for its scent, flavor, or therapeutic properties.
- Herbal medicines involves using raw or processed herbs to achieve therapeutic objectives.
- Herbal remedies dates back over 5,000 years, to the Sumerians.

Parts That can be used

- Flowers
- Fruit & Berries.
- Roots, Rhizomes, Tubers, & Bulbs.
- Seeds.
- Sap & Gel
- Bark.

Sap & Gel



Bark

- Harvesting bark carries the risk of losing the whole plant through overstripping or (removing a whole band of bark). It is best to collect bark from outlying branches.



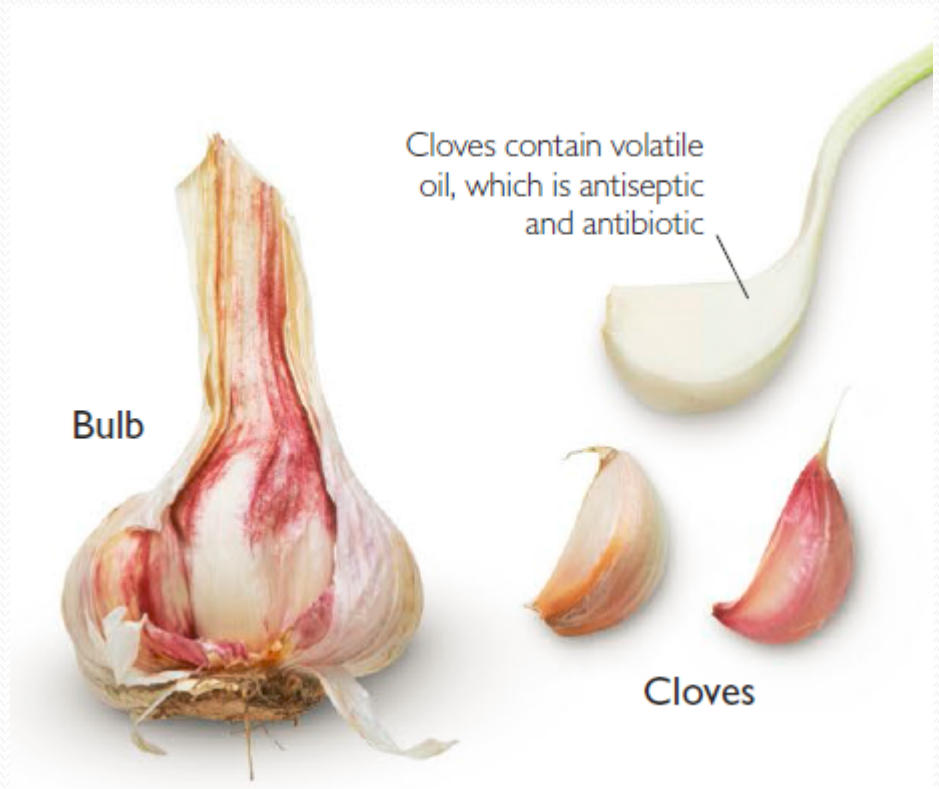
Advantages of Herbal Medicine

- More Affordable.
- Easier to Obtain
- Less adverse effects.
- Diverse benefits.

Raw Garlic

It contains flavonoids, oligosaccharides and used for :

- Diabetes.
- Inflammation.
- Boost immune system.
- Regulate blood pressure.
- Anti-viral activity.



Ginger

Benefits of ginger come from the oily resin Gingerols:

- Boost immune function.
- Treat stomach ulcers.
- **Inhibit growth of cancer cells.**



Turmeric

It is a very common flavoring agent that is :

- Potent antioxidant.
- Anti-inflammatory.
- **Antimutagenic.**
- Antimicrobial.
- Anticancer properties.



Ginseng

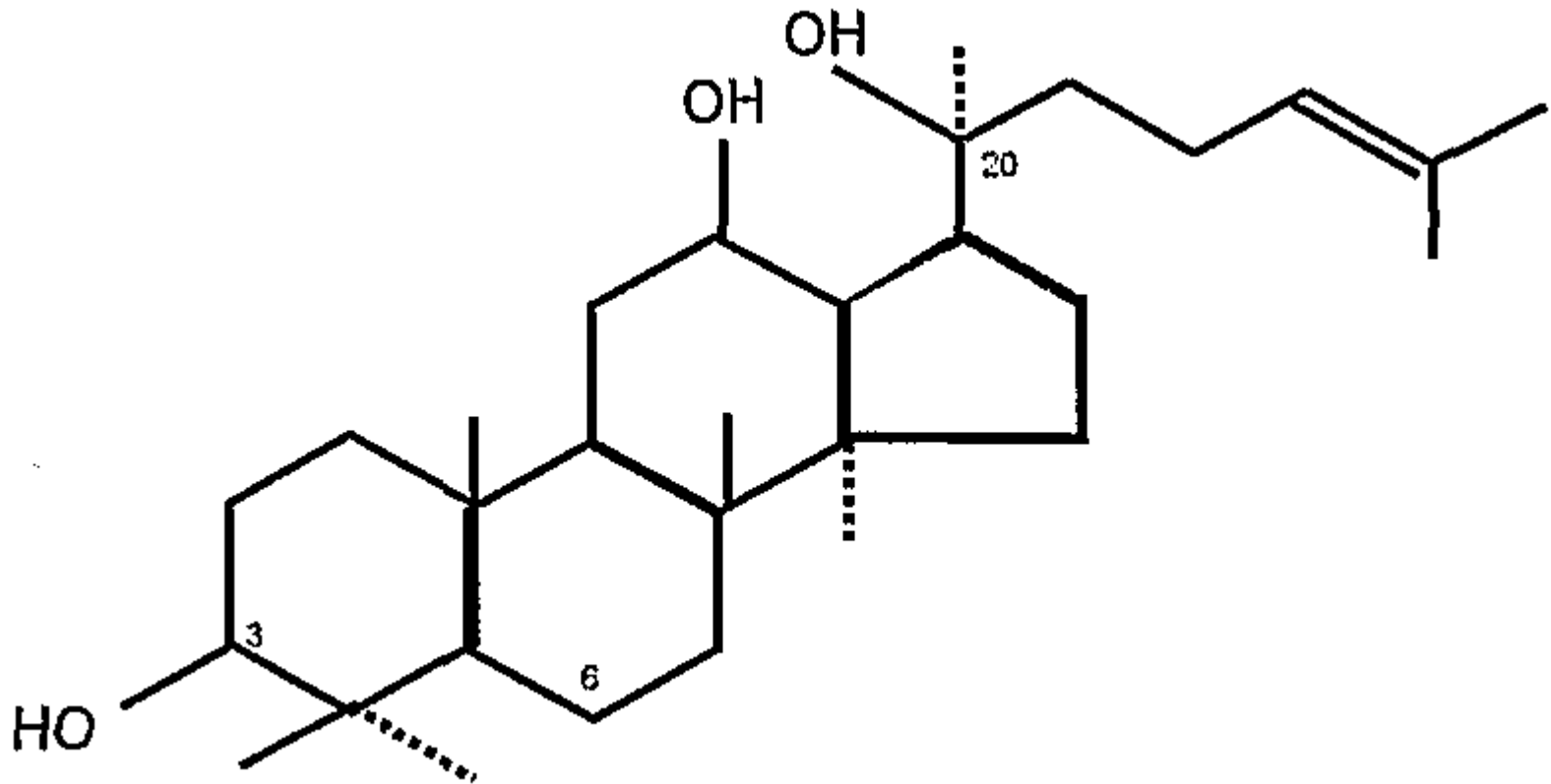
Ginseng is one of the most popular herbal medicines in the world :

- Stimulant.
- Treatment for infertility.
- Weight loss.
- Poor sleep.



Fresh root

Ginseng Structure

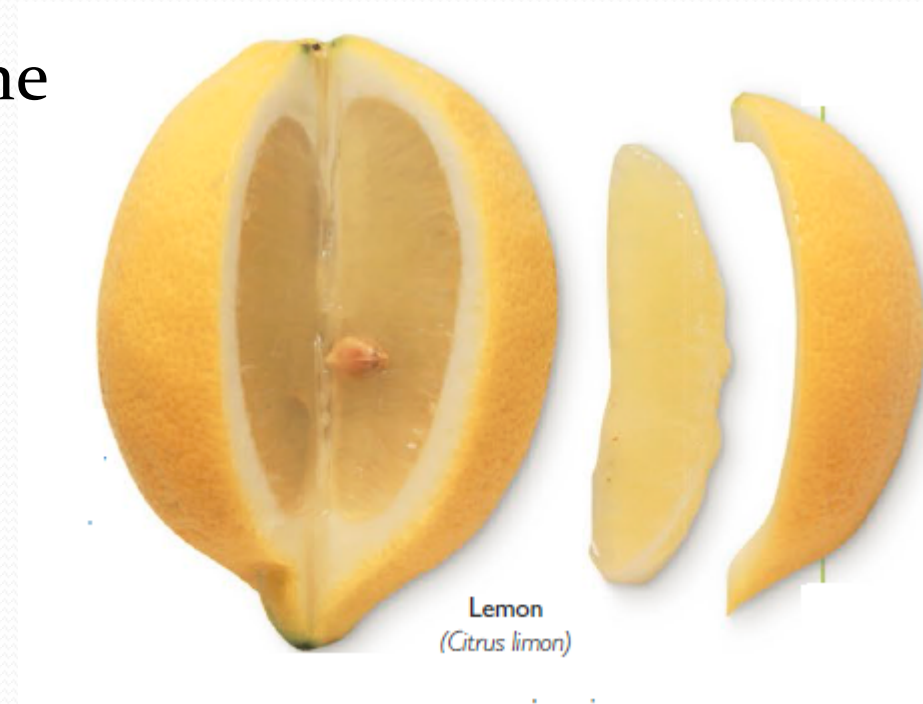


Active Constituents

- The medicinal effects of plants are due to the active constituents that have been isolated and studied extensively.
- The active components of a plant can be **destroyed** due to extraction techniques that are incompatible as in processes involving **heat**.

Flavonoids

- Found widely throughout the plant world, acting as pigments, imparting color, often yellow to fruits.
- They are antioxidant and especially useful in maintaining healthy circulation and **cold remedies**.



Phenols

- Phenols are a very varied group of plant constituents ranging from **salicylic acid**, a molecule similar to aspirin (acetylsalicylic acid), to complex sugar-containing phenolic glycosides.
- Antioxidant and anti-inflammatory.



Thyme
(*Thymus vulgaris*)

Volatile Oils

- They are important medicinally active plant constituents, also used widely in perfumery.
- Essential oil, is anti-inflammatory and antiallergenic. **On distillation, some essential oils contain compounds not found in the volatile oil.**



German Chamomile
(*Chamomilla recutita*)

Coumarins

- Coumarins of different kinds are found in many plant species and have widely.
- They have divergent actions. help to keep the **blood thin** and as smooth-muscle relaxant.



Celery
(*Apium graveolens*)

Others



Proanthocyanins
Black Berries



Anthraquinones
Chinese Rhubarb



Alkaloids
Night shade

Drugs Extracted From Herbs

- Some of the currently available drugs are directly extracted from plants.
- Some drugs are synthesized chemically in Pharmaceutical labs.
- Others are Semi-synthetic.

Semi-synthetic Drugs

- **Paclitaxel** is an **anti Tubulin** drug.
- It is used for different types of cancer.
- Can also be used externally to kill fleas and lice but has **high toxicity** risk.



pacific yew

Tubocurarine

- It is an alkaloid that has been traditionally used as **poison on arrows**.
- It is used as a **neuromuscular-blocking** drugs mostly during anesthesia.



Chondrodendron Tomentosum

Morphine

- Is an **opioid analgesic** that is used for severe pain and during anesthesia.
- It can also be used to treat **cough and diarrhea**.



Opium Poppy

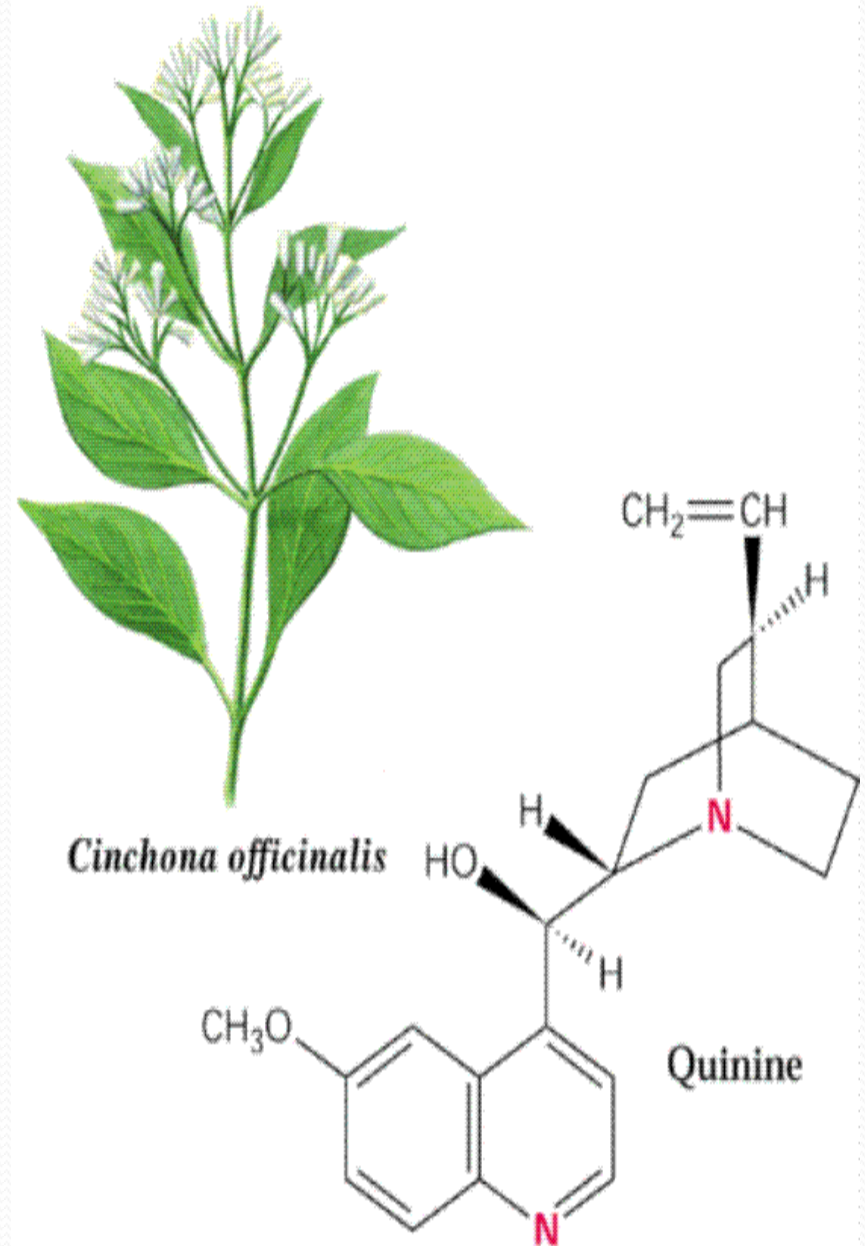
Digoxin

- It is used mainly for **Heart failure**.
- Can also be for different arrhythmia condition like atrial fibrillation and atrial flutter.



Quinine

- For centuries it was the most widely taken **antimalarial remedy** in the world.
- Used treatment of malaria due to *Plasmodium falciparum* that is **resistant** to chloroquine.



Toxicity

- Despite the fact the herbal medicine is relatively less toxic than synthesized medicine, it can still be toxic in certain cases.
- Examples include *Atropa belladonna* and *Digitalis purpurea*.
- Unfortunately, herbs are labeled as dietary supplements and they can be marketed **without FDA approval**.

New Herbs

- Pawpaw Fruit (*Carica papaya*).
- Blue Butterfly Pea (*Clitoria ternatea*).
- Goldilocks (*Chiliadenus iphionoides*).

Pawpaw Fruit

- The pawpaw tree is indigenous to several areas of **North America**.
- It contains **acetogenins** that have been shown to so powerful in fighting insects, cancer cells and lice.

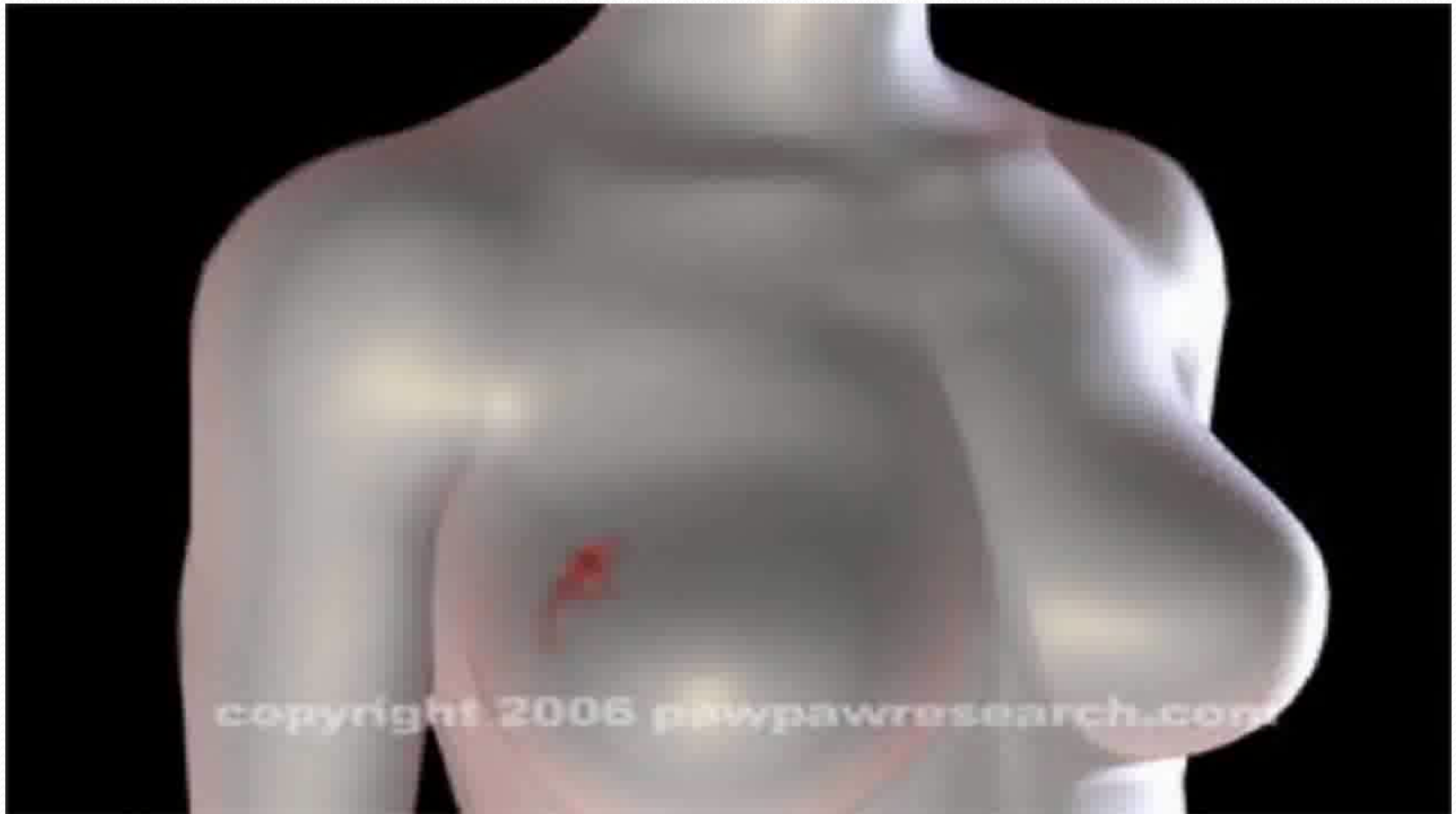


Pawpaw Fruit

- It attacks **mitochondria** of cancerous cells.
- This disables efflux pumps preserving chemotherapeutics in the cells.
- It also induces apoptosis and slows angiogenesis.



Pawpaw Fruit



Blue Butterfly Pea

- The plant is commonly used to enhance memory, as well as an anti-depressant and anti-stress agent.
- It acts by **joining longer chains of amino acids** to produce proteins.



Goldilocks

- Improve **insulin secretion** and **glucose absorption** in people with diabetes.



Conclusion

- The field of herbal medicine is a promising field in terms of discovering safe remedies for diseases.
- The Currently known medical herbs are but the **tip of the iceberg**.