



Faculty of Pharmacy and Biotechnology  
Pharmaceutical Biology Department

# Phytotherapy and Biogenic Drugs

## (PHBL 961)

### Lecture 1

Digestive System Problems & Remedies

**Associate Prof. Heba Handoussa**



# Lecture Content:

## •Digestive System Problems & Remedies

**A- Motion Sickness.**

**B- Anorexia (Appetite loss).**

**C- Dyspepsia.**

**D- Peptic ulcer.**

**E-Hepatotoxicity (Liver Damage):**

**F- Constipation**



# Learning outcomes

- By the end of the lecture the student would be able to:
- Explain different diseases affecting the digestive system.
- Mention herbal treatment for each of the problems.
- Discuss the contraindications for each herbal medicine.



## Intended learning outcomes of the lecture:

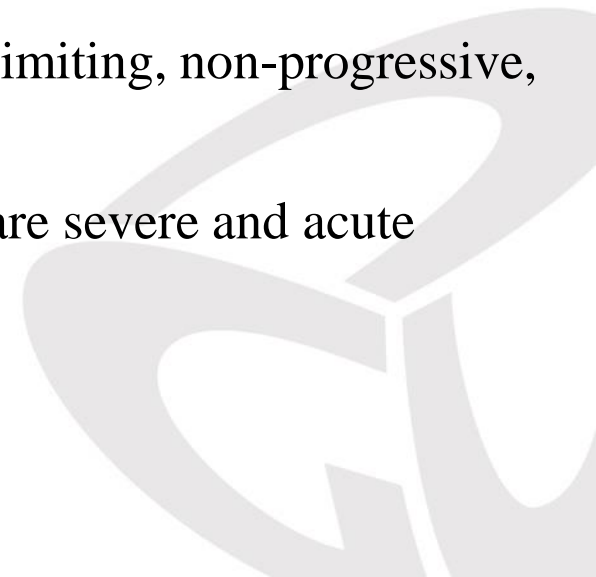
- a2. Memorize herbal drugs & phytopharmaceuticals and their medicinal indications & limitations.
- a3. Specify methods of extraction & tea preparation for each herbal remedy.
- b1. Use the proper pharmaceutical & medical terms, abbreviations & symbols in pharmacy practice, as related to herbal drugs & phytopharmaceuticals
- b3. Maintain the rational use of herbal and other drugs, in addition to social health hazards of drug abuse & misuse in critical diseases status.
- c1. Employ the concept of safety of herbal remedies and phytopharmaceuticals in the selection of appropriate herbal medications.
- c4. Assess drug interactions, adverse drug reactions as related to herbal medicines.
- c5. Determine the safety of herbal remedies & phytopharmaceuticals.
- c6. Analyze the concept of evidence- based information needed in pharmacy practice.
- d1. Solve questions independently to understand scientific principles rather than memorizing.
- d2. Demonstrate written skills.
- d3. Generate activities by discussing some clinical cases.



## Definitions

### Phytotherapy:

- It is a curing ability using bioactive plants-derived medication (Phytopharmaceuticals) as medication.
- These phytopharmaceuticals could be plants, herbs or crude products, few products relate to animals, fungi & bacteria.
- Use of pure plant components e.g. atropine, reserpine, morphine or digoxin is not phytotherapy.
- Phytotherapy is useful for treatment of simple, mild, self-limiting, non-progressive, acute or often chronic diseases.
- Diseases that should not be considered for phytotherapy are severe and acute progressive diseases.





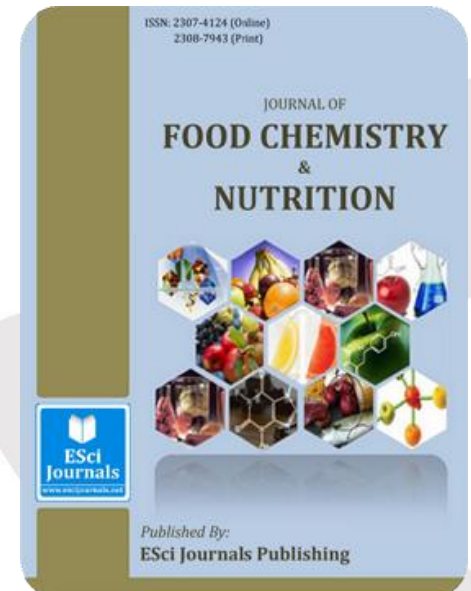
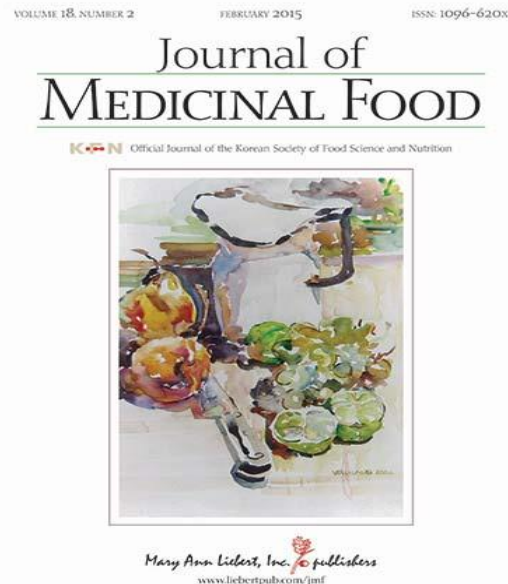
## Dietary supplements:

Nutraceuticals- Functional Foods- Health Food Supplements. All these terms refer to food-based mineral and vitamin preparations as well as plant-based serve as foods and drugs at the same time, ....etc.

Examples: *Grapes : contains antioxidant procyanidins.*

*Citrus Fruits: contains antioxidant vitamin C.*

*Green Tea : contains antioxidant procyanidins and catechins*





## Definitions

### Natural products:

Could be defined as organic compounds in the molecular weight range 100-2000. In a border sense, the term natural products can also be applied to bulk substances from nature, such as crude plant material, extracts, exudates, resins,.....etc.

### Complementary / Alternative Medicine ( CAM ):

This includes other types of practice of medicine, other than conventional medicine, encountered worldwide in different cultures.

- Physical therapy ( Massage, Thermotherapy, Aromatherapy, Yoga and meditation).
- Phytotherapy ??????????.

### Conventional medicine:

The type of medicine that uses pure chemicals in treatment of disease (standardized crude dosage).....*compare it to phytotherapy* 😊.



## Differences between Herbal & conventional drugs.



### Herbal

### Conventional



<ul style="list-style-type: none"><li>• They are crude <u>complex preparations</u></li><li>• Could be single powdered or mixed plants parts, extracts, medicinal oils (fixed or volatile)</li></ul>	<ul style="list-style-type: none"><li>• They are mostly <u>synthesized</u> or could be crude, conventional drugs are pure chemicals or combinations of two or more of such pure compounds</li></ul>
<ul style="list-style-type: none"><li>• <u>Dilute preparations</u> in terms of the active principles. Hence the dose is generally a sizable dose.</li></ul>	<ul style="list-style-type: none"><li>• <u>Standardized form</u> with definite amounts.</li></ul>
<ul style="list-style-type: none"><li>• <u>Minimal</u> side effects, <u>safe</u>, <u>available</u> and <u>cheap</u>.</li></ul>	Maximal <u>side effects</u> ,-----.
<ul style="list-style-type: none"><li>• The exact active principle of the herbal medicine maybe <u>known or specified</u> or otherwise the activity may be due to a combination of active compounds.</li></ul>	The activity is due to <u>single active constituents</u> .
<ul style="list-style-type: none"><li>• Herbal dosage forms: <u>Bulk powders, Teas, hard gelatin capsules, standardized extracts.</u></li></ul>	Conventional dosage forms: <u>capsules</u> , tablets, injections,.....





## What determines the suitable dosage form(s) for a given herb?

Three factors are important and should all be considered together :

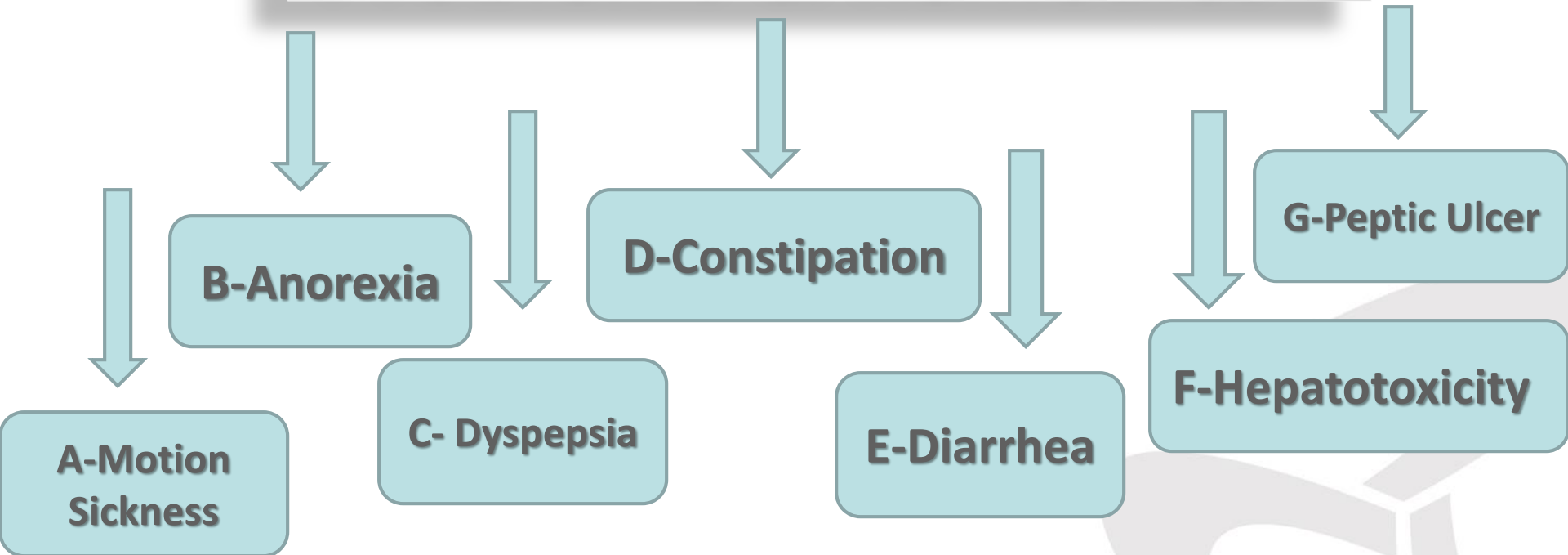
- 1- Solubility of the active principle in water.
- 2- Heat stability.
- 3- Concentration of the active principle in the dried herb.

## Quality Determination of Herbs and Herbal remedies :

- 1- **Entire or coarse cut herbs** → Sensory, macroscopic & microscopic.
- 2- **Powdered herbs** → Microscopic for identity and purity.
- 3- **Extracts** → HPLC analysis for identity.
- 4- **Vol. oils** → GC analysis for identity, purity & content of the active principle.
- 5- **Fixed oil** → GC analysis after conversion into fatty acid methyl esters.
- 6- **Tablets or capsules containing a given herbal powder** → proper extraction and proceed as under extracts.



# Digestive System Problems & Remedies



# A- Motion Sickness



## •Etiology:

**Motion sickness** is the syndrome of dizziness, nausea, weakness, and which may progress to vomiting, caused by stimulation of the semicircular canals in the ears during travel or repeated motion.

## •Suggested treatment: Ginger Rhizomes

•Ginger (*Zingiber officinale*) is one of the more commonly used herbal supplements.

**Active principle:** V.oil: Zingiberine & Bisaboline.

**Oily resin:** Gingerols ( pungent ingredient)

*These active constituents are responsible for increasing gastric motility but it has no direct antiemetic effects.*

it appears to inhibit serotonin receptors, (Increased serotonergic neurotransmission causes nausea and vomiting)

**Side effects:** Increase Bleeding tendency? Inhibits thromboxane synthetase.

## **Contraindications:**

Ginger should be taken with **cautious** in biliary obstruction (gall stones),hypertensive patients.as well as diabetic patients.



The patch, sold under the brand name Transderm Scōp, contains the drug **scopolamine**. Worn behind the ear, it works similarly to antihistamines—by interfering with the communication between nerves and the part of the brain that controls vomiting. releasing a steady dose of medication over three days, Apply the patch at least four hours before travel.



Scientists believe that scopolamine prevents communication between the nerves of the vestibule and vomiting center in the brain by blocking the action of acetylcholine (anticholinergic effect). Scopolamine also may work directly on the vomiting center.

Peppermint, Fennel and Fenugreek also are used to reduce the motion sickness severity.



## B- Anorexia (Appetite loss).


### •Etiology:

*Etiology is unknown but typically begins with restricted dieting, then propelled by complex interaction of socio-cultural, psychological, familial, biological, stress and genetic factors.*

### •Suggested treatment: Bitter herbs (Major Bitters) &/ or (Minor Bitters).....

The bitter taste stimulates by reflex action salivary and gastric secretions, thus stimulating appetite so, it is not useful in anorexia nervosa.

### Examples:

Major Bitters	Minor Bitters	
Gentian rhizomes & roots Secoiridoid glycosides <u>Gentiopicrosin</u> (major) 300 mg minutes before each meal	Bitter stick herb Bitter principle	
Centaury herb (leaves, flowers & stems). Secoiridoid glycosides <u>Centapicrosin</u>	Wormwood Bitter principle	



## How Vitamin and Mineral Deficiency lead to Anorexia

### **Vitamin B1 (thiamin) deficiency.**

Vitamin B1 (thiamin). Easily depleted by under-eating, this is one of the nutrients that your body cannot make itself, so you must get B1 from foods, primarily the whole foods that chronic dieters and people with eating disorders rarely eat enough of: beans, whole grains, seeds, meats, and vegetables.

### **Zinc deficiency.**

Red meat, egg yolk, and sunflower seeds are high in zinc.

*Anorexia nervosa* has been linked to a zinc deficiency. Pumpkin seeds are an excellent source of this mineral.



## C- Dyspepsia (Indigestion)



### • Etiology:

**Dyspepsia** describes a symptom complex thought to, arise in the upper gastrointestinal tract, in addition to epigastric pain or discomfort, symptoms such as heartburn, mild diarrhea, excessive nausea and bloating, a feeling of slow digestion.

### • Suggested treatment: Two lines; ( Carminatives &/ Cholagogues)

#### 1. Carminatives

**Active principle:** V.oil e.g.; Mint ( Menthol) and Chamomile ( $\alpha$ -bisabolol).

*These active constituents are responsible for the antispasmodic effect, antiseptic and tachygastria effect.*

**Contraindications:** Mint shouldn't be used for Newborn & infants, menthol may cause choking while Chamomile may cause allergic reactions in patients hypersensitive to Asteraceae (i.e. Asteraceae hypersensitivity due to sesquiterpene lactones with exocyclic methylene group).

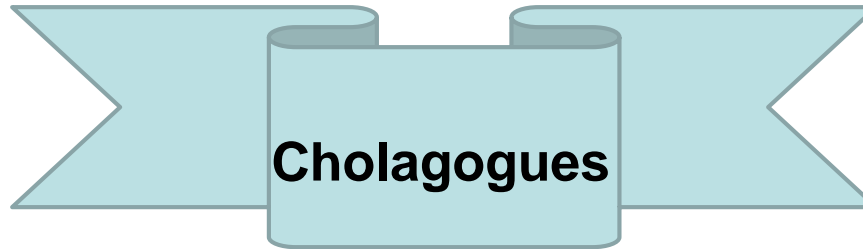


## **Second line: Cholagogues:**

This line has the ability to treat indigestion (dyspepsia) caused by fatty foods, which is related to decreased bile secretion.

### **Cholekinetics:**

These stimulate gallbladder emptying & contractility power of bile duct mint & curcum



### **Choleretics :**

These stimulate production of bile by liver e.g. boldo and curcum.

### ➤ **Curcum (Turmeric) rhizomes:**

It has a cholekinetic effect due to the presence of curcumin and V. oil (turmerones) of choleretic effect

☹️ But it shouldn't be used for patients with gallstones.

☹️ Used as capsules (powder) or fluid ext. due to relative insolubility of active compounds.

### ➤ **Boldo leaves :**

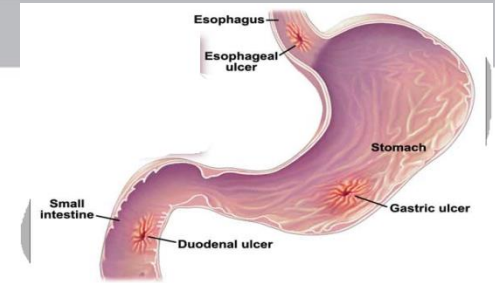
Vol. oil (40 % ascaridole) bile stimulant.

Alkaloids e.g. boldine (choleretic)





## D- Peptic ulcer



### •Etiology:

A **peptic ulcer** is a hole in the lining of the stomach, duodenum, or esophagus. An ulcer is a sore or erosion that forms when the lining of the digestive system is corroded by acidic digestive juices due to: Increased gastric H<sup>+</sup> secretion, Oesophageal reflux, NSAIDs as a side effect, bacterium *Helicobacter pylori*.

### •Suggested treatment:( Liquorice, Ginger Rhizomes, Solanaceae Herbs)



**Liquorice** is very important remedy due to the presence of triterpenoid Glycyrrhizin (a sweet tasting saponin-like compounds) . It has anti-inflammatory & promote ulcer healing, the carbenoxolone group lead to an increase in pH at the stomach from 1.1 to 6.0, and a reduction in basal and histamine-induced gastric acid secretion.



**Side effects:** Na<sup>+</sup> retention & oedema, High blood pressure and Hypokalemia & muscle weakness



## Other Antiulcer Natural remedies:

- **Fresh Ginger Rhizomes :**

Extracts inhibit gastric secretions & stress induced lesions (needs clinical confirmation).

Compositional analysis favored by determination of the efficacy of individual phenolic acids towards their potential ulcer-preventive ability revealed that between cinnamic (50%) and gallic (46%) phenolic acids, cinnamic acid appear to contribute to better H<sup>+</sup>, K<sup>+</sup>-ATPase and *Helicobacter pylori* inhibitory activity, while gallic acid contributes significantly to anti-oxidant activity. ([Nanjundaiah](#) et al., 2011)

- **Solanaceae Herbs e.g. Datura :**

Decrease gastric secretions. Not considered a typical herbal drug, but available as standardized dosage forms (OTC or prescription drugs).

- **Honey:**

It includes polyphenols and other antioxidants. Honey is a powerful antibacterial and has been shown to inhibit *H. pylori* growth. It has the ability to form a protective layer along with the stomach lining.

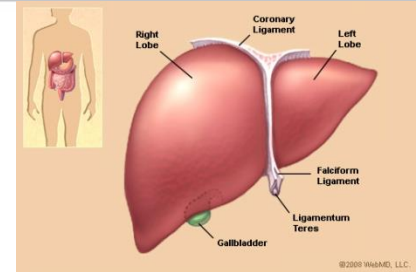
Some foods can make ulcers worse, while some provide a preventive and healing effect. Greasy and acidic foods are most likely to irritate the stomach, and spicy foods.

To reduce ulcer pain, avoid:

coffee, chilis and hot peppers processed foods, salty, red meat and deep fried foods



## E- Hepatotoxicity (Liver Damage):



### •Etiology:

#### ❑ Acute Liver Damage :

**Causes :** *Certain diseases e.g. Viral hepatitis, Vascular disorders, Metabolic diseases. And Hepatotoxic agents (Alcohol & certain drugs, Certain herbal constituents).*

### •Etiology:

❑ **Chronic Liver Damage:** *results in cirrhosis, which leads to fibrosis, necrosis degeneration of hepatocytes due to chronic alcohol use or abuse and chronic viral hepatitis.*

### •Suggested treatment

i- **Supportive Treatment:**

ii- **Anti-hepatotoxic agents:**

This may be useful in prevention and some may be useful also in hepatocyte regeneration.

iii- **Liver Transplantation:** For cirrhosis (chronic liver damage).





## Antihepatotoxic Agents & Herbs :

### i- Milk Thistle :

**Active principle:** Silymarin (a mix. of 4 flavanolignans).

Used as a standardized extract or mixed pure lignans (silymarin); teas are not suitable.

*Silymarin treatment (Legalon) restored the hepatocyte functional and histopathological alterations* ([Freitag](#) et al., 2015)

### ii-Schizandra Fruits :

**Const.:** A mix. of biphenyloctacyclic lignans e.g. schizandrins.

Note: DDB (the yellow pill) is a semisynthetic analog.

### iii- Various Antioxidants :

Have a liver-protecting effect e.g. green tea, grape seed extract, bilberry fresh fruit, flavonoids.....etc.



## F- Constipation:

### Etiology:

Decrease in frequency of fecal elimination and/or hardness of stools due to: Inadequate water intake, fiber in the diet, Inadequate activity or exercise or immobility, Stress, Overuse of laxatives (stool softeners) weaken the bowel.

The constipation patient should be advised to eat more fiber-rich diet, with adequate fluid intake in addition to regular physical activity.

### Treatment : Laxatives .

- i- Bulk laxatives.
- ii- Osmotic laxatives.
- iii- Stimulant laxatives



## Constipation Treatment

### Bulk laxatives

- (Absorb water leading to stimulate peristalsis & emptying of bowel).

#### •**Psyllium seed/ or husk.**

Treatment of constipation especially in pregnancy. The dose is taken with sufficient water or fluids due to the presence of high mucilage content.



- Patient should take care as limited water intake may lead to bowel Obstruction.

### Osmotic laxatives

This type of laxatives are responsible for softening of stools **e.g. mannitol & sorbitol** which are not absorbed in G.I.T. and not metabolized by colon flora.

**Stimulant laxatives** Stimulant laxatives irritate the intestinal wall stimulating intestinal contractions as the body works urgently to rid itself  
.....continued.

# Stimulant (Irritant) Laxatives

## 1. Anthraquinones-containing drugs :

**i-Mild laxatives (highly recommended);**

Senna leaflets & pods, Cascara bark, Frangula bark.

**ii- Purgative ( potent laxative):**

Aloe (Dried cell sap or juice).

**iii-Rhubarb contains**

**(anthraquinones & tannins)**

It is neither laxative nor astringent.

Thus it is used as a stomachic).

## 2- Castor Seed Oil :

Contains ricinoleic acid, a hydroxyfatty acid. It is also a mild laxative.

## 3- Jalap Root :

Contains jalap resin (long chain hydroxyfatty acids).It is a cathartic (potent purgative).

## 4- Colocynth Fruit Pulp :

Contains resin (cucurbitacins). It is a hydragogue(potent cathartic).

## Notes :

Only mild laxatives are recommended, while, Purgatives, cathartics & hydragogues are not recommended since they give higher incidence of S.E.



## Laxatives Side Effects:

- i- Cramps (gripping) with more potent laxatives.
- ii- Electrolyte imbalance e.g. hypokalemia & dehydration.
- iii- Large doses and chronic use causes nephritis, colon pigmentation & laxative habit (over emptying of the bowel).

## Drug Interactions & Contraindications :

### •**Hypokalemia induced drugs:**

Cardiac glycosides, antiarrhythmic agents, Diuretics & corticosteroids.

•**Pregnancy** : Anthraquinones pass the placental barrier (possible teratogenicity).

•**Lactation** : Anthraquinones excreted in the milk (possible mutagenicity).

• **Infants** : Anthraquinones are contraindicated.





# the pros of PROBIOTICS & GOOD GUT HEALTH

## WHAT ARE PROBIOTICS?

'FOR' + 'LIFE'

Probiotics are living bacteria that work together with your body providing numerous health benefits. They are beneficial bacteria that help maintain proper balance in your digestive system.

## Egyptian Gold



Egyptian Gold includes the biblical essential oils rose, cinnamon, balsam fir, and lavender, renowned for spiritual sensitivities. This transcendent blend gently enhances moments of devotion and reverence. Uses: spiritual awareness, immune support.

Ingredients: Frankincense, lavender, Canadian balsam fir, myrrh, spikenard, hyssop, cedarwood, rose, and cinnamon essential oils.

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'PROBIOTICS ARE THE  
NEXT VITAMINS,'

~Dr. Shekhar Challa

Human brain  
3 LBS



VS



Bacteria living  
in a healthy  
body  
3.5 LBS

Even though probiotic-rich foods are healthful choices, you need to take a probiotic supplement to ingest enough bacteria to make a **difference**. Supplements are especially important if you're treating a specific illness, such as IBS or other health issues.

IBS | CELIAC DISEASE | COLON CANCER | CROHN'S  
DISEASE | LACTOSE INTOLERANCE | ULCERATIVE COLITIS