Complementary and Alternative medicine

PHG 323 (Phytotherapy)

Part 4
Phytotherapy (cont.)

2) Gastro-Intestinal Disorders

Among the GIT disorders that could be treated by phytotherapy:

I) Stomatitis التهاب الفم
   Gingivitis التهاب اللثة
   Glossitis التهاب اللسان

II) Stomach and Intestinal Disorders

III) Liver and Biliary Tract Disorders
II. Stomach and Intestinal Disorders

1) Functional dyspepsia  سوء الهضم
2) Flatulence  الانتفاخ
3) Gastritis and Peptic ulcers  التهاب المعدة / قرحة المعدة والإثنى عشر
4) Constipation  الإمساك
5) Diarrhea  الإسهال
6) Irritable Bowel Syndrome (IBS)  القولون العصبي
7) Hemorrhoids  البواسير
8) Intestinal worms  الديدان المعوية
1) Functional (Non-ulcer) dyspepsia

- It is a common syndrome of **recurrent** or **persistent** pain or **discomfort** in the upper abdomen and characterized by:
  - Nausea
  - Epigastric pressure
  - Bloating
  - Cramp

- Its cause is **unknown**, but certain factors play a role in occurrence:
  - Deficiency in **gastric secretions** and **bile production**
  - Disorders in **gastric motility**
  - *Helicobacter pylori* infection
  - Meal indigestion
Phytotherapy of dyspepsia include:

1) Bitters
2) Choleretic and cholagogues
3) Carminatives (see under Flatulence)

1) Bitter drugs (Eupeptics) (Eu = well, pepsis: digestion):
   - act on oral taste receptors → facilitate saliva secretion (~ 30 min)
   - promote gastric juice and HCl secretion → facilitate digestion.
   - Eupeptics are classified into:
     a) Pure bitters (e.g. gentian, quassia,..)
     b) Aromatic bitters (e.g. bitter-orange peel)
     c) Pungent bitters (e.g. ginger)
     d) Alkaloidal bitters (e.g. quinine)
<table>
<thead>
<tr>
<th>Common (Latin) names</th>
<th>Part used</th>
<th>Key comp.</th>
<th>Dose /d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gentian (<em>Gentiana lutea</em>)</td>
<td>Roots</td>
<td>Bitter iridoid glycosides</td>
<td>3 g</td>
</tr>
<tr>
<td>Bitter orange (<em>Citrus aurantium</em>)</td>
<td>Peels</td>
<td>Volatile oil - Flavonoids</td>
<td>~5 g</td>
</tr>
<tr>
<td>Ginger (<em>Zingiber officinale</em>)</td>
<td>Rhizomes</td>
<td>Pungent phenols: gingerol &amp; shogaol - Volatile oil</td>
<td>~3 g</td>
</tr>
<tr>
<td>Quinine (<em>Cinchona spp.</em>)</td>
<td>Bark</td>
<td>Alkaloids e.g. quinine - Tannins</td>
<td>~2 g</td>
</tr>
</tbody>
</table>

Department of Pharmacognosy – College of Pharmacy - KSU
a) **Gentian** (a pure bitter, see table)

- **Uses:** Eupeptic and appetite stimulant

  **N.B.** It is **contra-indicated** in gastro-duodenal ulcers (as it stimulates gastric juice secretion)

- **Dose:**

  1 g / 150 ml **water** as **decoction** (to be taken 30 minutes **before** meal) x 3 times.

b) **Bitter orange peel** (an aromatic bitter, see table)

- It is aromatic due to the presence of **volatile oil** (contain up to 90% **limonene**) and bitter because of **flavonoids**.
Uses and action:

- Increases *gastric juice* secretion (effect of bitterness)
- Treatment of *loss of appetite* and dyspeptic *complaints*
  
  - It behave as *carminatives* as they expel excessive intestinal gases (effect of volatile oil).
  
  - It has *mild spasmolytic effect* (effect of volatile oil).
  
  - It has *antibacterial* action (effect of flavonoids and limonene).
c) **Ginger** (a pungent bitter, see table)

**N.B.** The *pungent principles* are the alkylated phenols *gingerols* and *shogaols* (not the volatile oil).

- **Uses and action:**
  - Promotes saliva and gastric *secretions*
  - Stimulates intestinal *peristalsis*
  - Antispasmodic effect on smooth *muscles*
  - Positive effect against motion sickness
  - Anti-nausea and antiemetic
d) Quinine (an alkaloidal bitter)

- They are **not used** commonly as eupeptics for their **unpleasant** side effects (cinchonism):
  - Tinnitus
  - Blurred vision
  - Confusion
  - Dizziness
  - Nausea and **Vomiting**

- In the United States, the US FDA limits the quinine content in tonic water to (83 mg/L), about 1/7 therapeutic dose against malaria
2) Choleretics and Cholagogues:

- **Choleretics** are agents that promotes bile secretion.
- **Cholagogues** are agents which stimulate the flow of bile.
- Most choleretic have cholagogue properties.

**Examples**

<table>
<thead>
<tr>
<th>Common (Latin) names</th>
<th>Part used</th>
<th>Key comp.</th>
<th>Dose/d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artichoke (Cynara scolymus)</td>
<td>Leaves</td>
<td>Caffeic acid deriv. (e.g. Cynarin) – flavonoids – sesquiterpene lactones</td>
<td>4-9 g</td>
</tr>
<tr>
<td>Turmeric (Curcuma domestica)</td>
<td>Rhizome</td>
<td>5% Curcuminoids (e.g. Curcumin) – volatile oil</td>
<td>2-3 g</td>
</tr>
<tr>
<td>Boldo (Peumus boldus)</td>
<td>Leaves</td>
<td>Boldine alkaloid – flavonoids – volatile oil</td>
<td>2-3 g</td>
</tr>
</tbody>
</table>
a) Artichoke: (cont.)

- **Uses/Effects:**
  - Promotion of bile production and flow → promotes **fat digestion**.
  - Large quantities of bile → **stimulate** intestinal **peristalsis** → better digestion.
  - Also, it treats **vomiting**, **nausea**, **abdominal pain** and **flatulence**.
  - It also has **hepatoprotective effect**.

**N.B.**

Artichoke is **contra-indicated** in patients with **bile duct occlusion**.
b) Turmeric:

- Uses/Effects:
  - It has both choleretic and cholagogue effects.
  - It is also used as a carminative and stomachic to treat digestive disorders such as flatulence and appetite loss.
  - It also has a long history as antiinflammatory and antiarthritic.
c) Boldo leaves:

- **Uses/Effects/dosage:**
  - **Boldine** is the responsible choleretic component of boldo leaves.
  - **Boldo** extract also inhibits lipid peroxidation in hepatocyte and can thus protects liver against damage by different xenobiotics.
  - **Boldo** is taken as a tea prepared with 2-3 g drug in 150 ml water.

**N.B.**
- The drug is contraindicated in patients with **bile duct obstruction** of and in cases of **gallstones**.
- The volatile oil **boldo** must not be used alone (contain high % of toxic ascaridole).
2. Flatulence:

- Flatulence is the presence of excessive amount of gases in the stomach and/or in the intestine.
- This may be resulted from bacterial imbalance in the colon and food sensitivity
- The symptoms include:
  - Abdominal bloating and pain
  - Belching

Phytotherapy of flatulence

Carminative agents (herbs – volatile oils) can be used to prevent the formation or cause the expulsion of gas in the alimentary tract.
## Examples of carminatives

<table>
<thead>
<tr>
<th>Common (Latin) names</th>
<th>Part used</th>
<th>Key comp.</th>
<th>Dose/d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anise <em>(Pimpinella anisum)</em></td>
<td>Fruits</td>
<td>2-6% Volatile oil (contains Anethole) – Caffeic acid derv. – Flavonoids</td>
<td>4-9 g</td>
</tr>
<tr>
<td>Peppermint <em>(Mentha piperita)</em></td>
<td>Leaves</td>
<td>Volatile oil (contains menthol and menthone) – Caffeic acid derv. – Flavonoids</td>
<td>3-6 g</td>
</tr>
<tr>
<td></td>
<td>oil</td>
<td></td>
<td>5-10 drops</td>
</tr>
</tbody>
</table>
a) Anise:
   - Uses:
     - As carminative, treatment of dyspeptic complaints and loss of appetite.

b) Peppermint:
   - Uses:
     - Choleretic and cholagogue
     - Carminative and spasmylytic
     - Mild anaesthetic (on the mucous membrane lining the stomach)
     - In irritable Bowel Syndrome
Peppermint oil can be used

- It has **antispasmodic property:**
  - smooth muscles relaxant → **reduction** of abdominal pains and symptoms

- The oil contains mainly *menthol*, a monocyclic terpene alcohol. *Menthol* has **Ca++ channel blocking** properties → inhibits the excitability of enteric nerves.

- **Dosage form:**
  - As enteric coated capsules, two capsules per day.

**c) Other volatile** oil-containing carminatives include: *Fennel*, Caraway and *Chamomile*
3. Gastritis and Peptic ulcers

- **Gastritis:**
  
  It is the **inflammation** of the stomach **mucosa** due to:
  - Spices
  - Alcohol
  - Tobacco
  - Bacteria (e.g. *Helicobacter pylori*)
  - Drugs such as aspirin or toxins

- **Peptic ulcer:**
  
  It is a **discrete mucosal damage** of the **stomach** and/or **duodenum**. It may be due to:

  1. **Imbalanced production** of acids or mucous.
  2. **Helicobacter pylori:** It infects **most** patients with **chronic gastritis**
- **Conventional treatment:**
  - In **mild cases** the use of **antacids** and **eradication** of *H. pylori* by antibiotics may help.
  - **Most patients** require an **H₂-receptor blocker** (e.g. Ranitidine) or a **proton pump inhibitor** (e.g. Omeprazole).

### Phytotherapy of gastritis and peptic ulcer (examples)

<table>
<thead>
<tr>
<th>Common (Latin) names</th>
<th>Part used</th>
<th>Key comp.</th>
<th>Dose/d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquorice</td>
<td>Roots &amp; Rhizomes</td>
<td>Triterpenoid saponins (Glycyrrhizin) – Flavonoid glycosides (e.g. Liquiritin)</td>
<td>2-4 g</td>
</tr>
<tr>
<td><strong>(Glcyrrhiza glabra)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slippery Elm</td>
<td>Inner bark</td>
<td>Mucilage – steroids – tannins</td>
<td>5-10 ml decoction</td>
</tr>
<tr>
<td><strong>Malva sylvestris</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marshmallow</td>
<td>See under herbal stomatics</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>(Malva sylvestris)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
a) Liquorice (one of ulcer healing plants)

- **Uses/effects:**
  - **Anti-inflammatory**
  - As flavoring/seeting agent to **mask**
    taste of **bitter drugs** e.g. aloe, quinine.
  - **Anti-ulcer/healing effect:**

  It inhibits **15-hydroxyprostaglandin dehydrogenase enzyme** and **delta-13-prostaglandin reductase** → **increase** levels of **protective prostaglandins** in stomach and intestine → **increase** protective mucous secretion + **increase** cell proliferation of the gastric mucosa + **inhibit** gastric secretion → **healing of ulcers**

*This effect may be related to glycyrrhizin. Its aglycone (glycyrrhetinic acid) also proved similar activity.*
N.B.

- Liquorice is contra-indicated in hypertension as due to sodium and water retention (cortisone-like effect)
- Deglycyrrhizinated licorice (DGL) is an alternative in treatment of ulcers. It can be used plus antacid to augment the effect.

b) Marshmallow  
c) Slippery Elm

- They are mucilaginous plants
- The mucilage content coats gastric mucosa → protect mucosa from the eroding effect of gastric acid.