

# Ethnobotany. Lecture 27

Alexey Shipunov

Minot State University

April 5, 2013



# Outline

- 1 Pharmacognosy
  - Plant remedies for gastrointestinal and biliary systems



# Pharmacognosy

## Plant remedies for gastrointestinal and biliary systems



# Diarrhoea

- Very common, especially in children
- Oral rehydration works well in most cases



# Plants for rehydration

- $\text{Na}^+$
- Starch from potatoes, corn or rice, or glucose



# Constipation and laxatives

- By medical definition, defecation less frequent than once in 2–3 days
- Not a serious problem but increase risks of other diseases



# Bulking laxative from plantains, *Plantago* and *Psyllium* spp.

- *Plantaginis ovatae semen*, *Psyllii semen*
- Have high swelling factor ( $> 40$ ) due to the presence of specific polysaccharides



# Isphagula, *Plantago ovata*





# Psyllium, *Psyllium sempervirens*



# Linseed, *Linum usitatissimum*

- *Lini semen*
- Should be used as whole seed

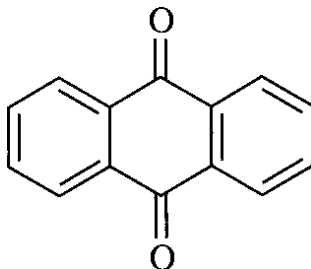


# Stimulant laxatives

- Normally, stimulant laxatives are anthraquinones
- Increase a peristaltic activity of a colon



# Antraquinone



# Senna, *Cassia* spp.

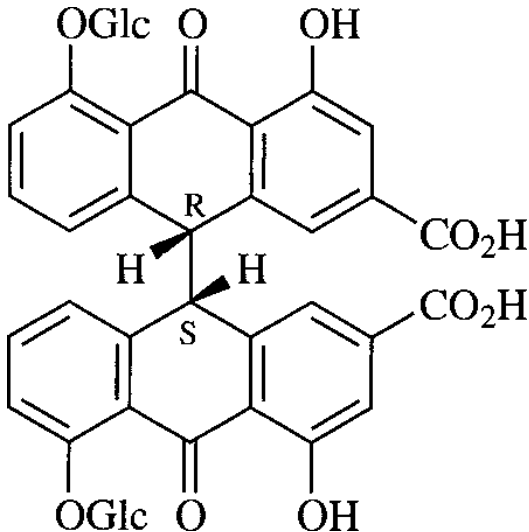
- *Sennae fructus/folium*
- Contain sennosides



# Senna, *Cassia senna*



# Sennoside B



# Cascara, *Rhamnus* spp.

- *Rhamni/Frangulae cortex*
- *Rhamnus purshiana* is native to Pacific coast
- Contain emodin, cascarosides and other anthraquinone glycosides

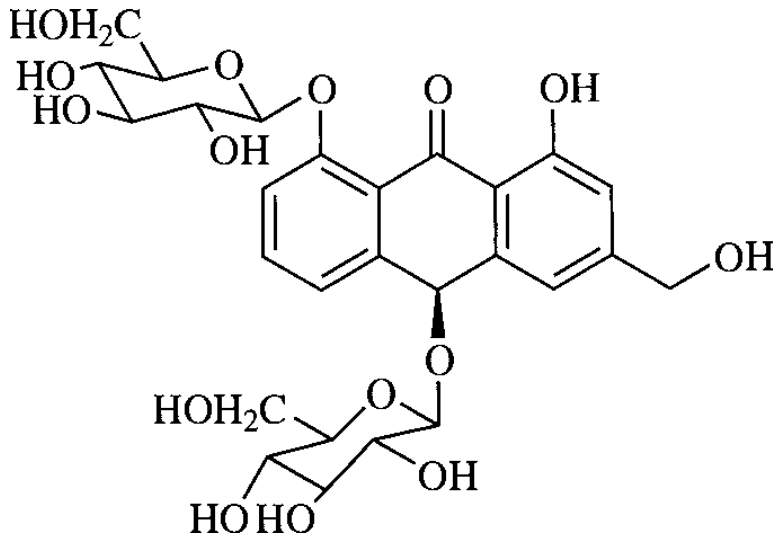




# Cascara, *Rhamnus purshiana*



# Cascaroside



# Inflammatory problems

- May be a signal about infectious gastritis
- Mixtures of emollient and antacid are mostly used



# Chamomile, *Matricaria recutita*

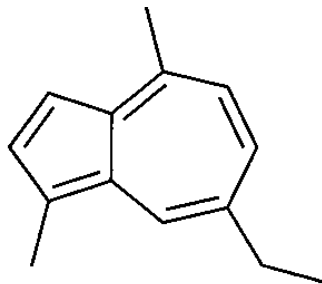
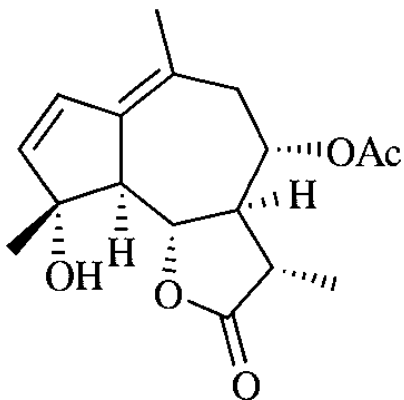
- *Matricariae flos*
- European herb (“German chamomile”)
- Multiple-effect drug, essential oils and other constituents are anti-inflammatory and anti-bacterial



# Chamomile, *Matricaria recutita*



# Matricin and chamazulene

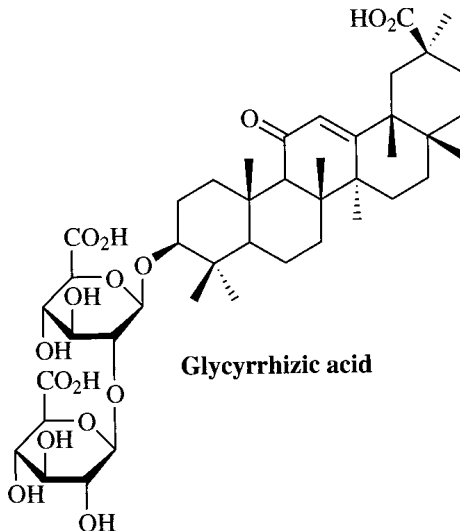


# Liquorice, *Glycyrrhiza glabra*

- *Liquiritiae radix*
- Main component is glycyrrhizic acid, traditional but controversial remedy



# Glycyrrhizic acid





# Dyspepsia and liver disorders

- Often are a sideways symptoms of more serious diseases
- Closely associated with eating habits
- Cholagogues and bitter stimulants are popular remedies



# Artichoke, *Cynara scolymus*

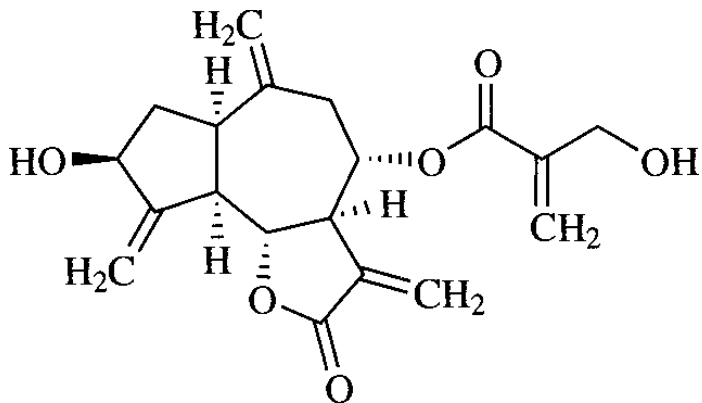
- *Cynarae folium*
- Main component is a bitter sesquiterpene cynaropicrin



# Artichoke, *Cynara scolymus*



# Cynaropicrin



# Gentian, *Gentiana lutea*

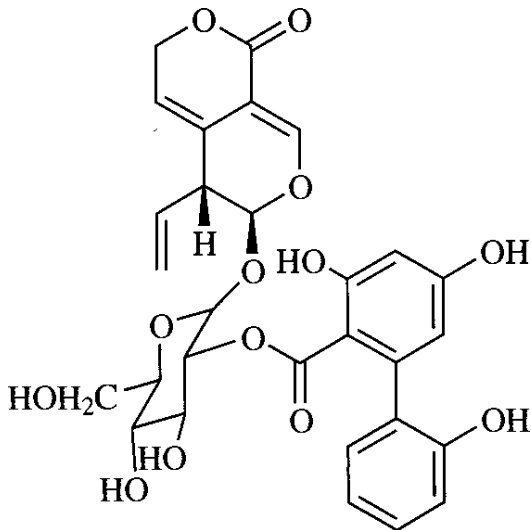
- *Gentianae radix*
- Gentiopicroside and amarogentin (bitter value of 58,000,000) are iridoids
- Bitters stimulate secretion of gastric juices



# Yellow gentian, *Gentiana lutea*



# Amarogentin



# Wormwood, *Artemisia absinthium*

- *Herba absinthii*
- Traditionally used as liqueur
- Bitter value of sesquiterpene absinthin is  $\approx 15,000$





# Wormwood, *Artemisia absinthium*



# Nausea and vomiting

- Often components of “motion sickness”
- Spasmolytic constituents are often used

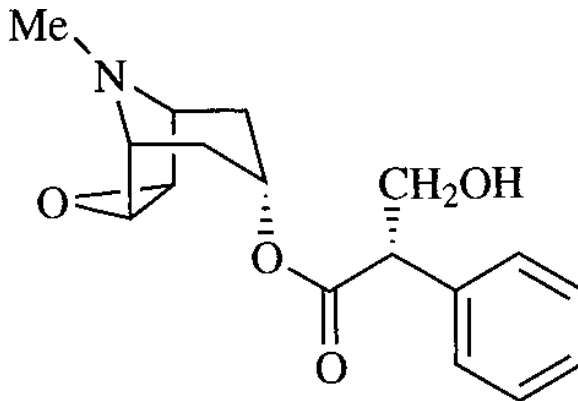


# Hyoscine from Solanaceae plants

- Occur in *Scopolia*, *Hyoscyamus* and *Datura*
- Tropane alkaloid, poisonous



# Hyoscine



# Ginger, *Zingiber officinale*

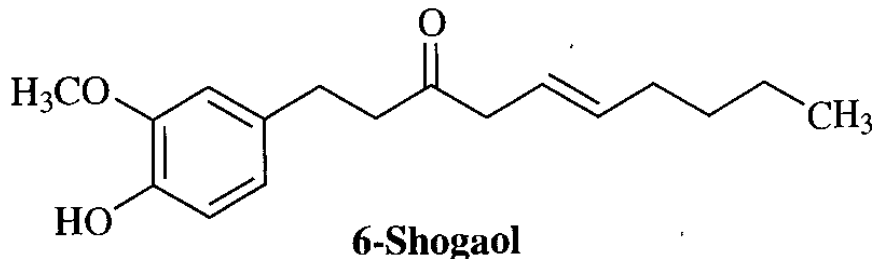
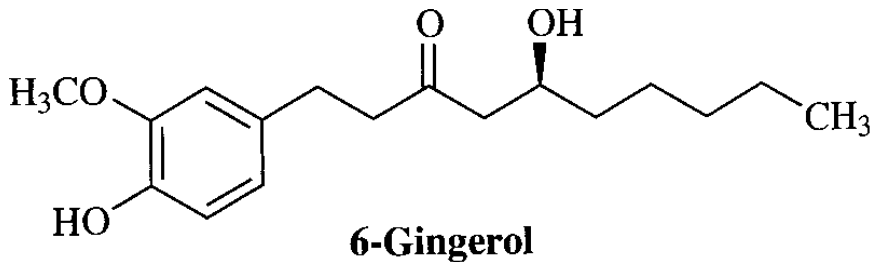
- *Zingiberis rhizoma*
- Multiple effect plant, essential oils gingerol and shogaol are responsible for pain relief, anti-sickness and other activities
- Extremely valuable in Eastern medicines



# Ginger, *Zingiber officinale*



# Gingerol and shoagol



# Bloating and carminatives

- Bloating may be a result of bacterial activity (especially on arabinose)
- Carminatives provide both pleasant taste and anti-gas effect (precise mechanism is still unclear)





# Mints, *Mentha* spp.

- *Menthae folium*
- Essential oil menthol and similar compounds



# Umbelliferous fruits

- *Carvi fructus* from caraway (*Carum carvi*)
- *Foeniculi fructus* from fennel (*Foeniculum vulgare*)
- Contain essential oils like carvone, anethole and others



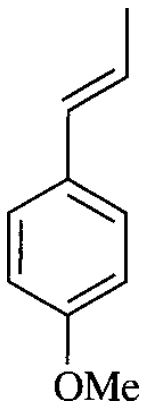
# Caraway, *Carum carvi*



# Section of mericarp



# Anethone



# Summary

- Most of plant remedies for gastrointestinal system are symptomatic
- Most of them are terpenes or glycosides



# For Further Reading



A. Shipunov.

*Ethnobotany* [Electronic resource].

2011—onwards.

Mode of access:

[http://ashipunov.info/shipunov/school/biol\\_310](http://ashipunov.info/shipunov/school/biol_310)



M. Heinrich and others.

*Fundamentals of pharmacognosy and phytotherapy* (selected chapters). [Electronic resource].

Churchill Livingstone, 2004.

Mode of access: [http://ashipunov.info/shipunov/school/biol\\_310/heinrich2004\\_fund\\_pharm\\_part.djvu](http://ashipunov.info/shipunov/school/biol_310/heinrich2004_fund_pharm_part.djvu)

**Pages 199–214.**

