

# Ethnobotany. Lecture 35

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# Outline

- 1 Anti-cancer plants (contd.)
- 2 Plants for supportive therapy
- 3 Harmful plants

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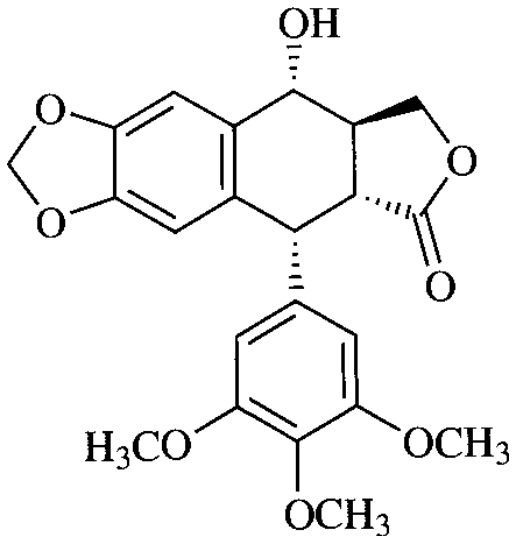
# Mayapple, *Podophyllum peltatum*, Berberidaceae, North America

- Rhizomes contain cytotoxic glycoside podophyllotoxin
- Working similarly to colchicine: binds to tubulin and prevents microtubule formation

# Mayapple



# Podophyllotoxin



# White birch, *Betula alba*, Betulaceae, Eurasia

- Betulinic acid (almost non-toxic!) is shown to have inhibiting effect on several tumor cell lines
- It is believed that birch canker fungus (“chaga”) also contains anti-cancer agents



# Birch canker



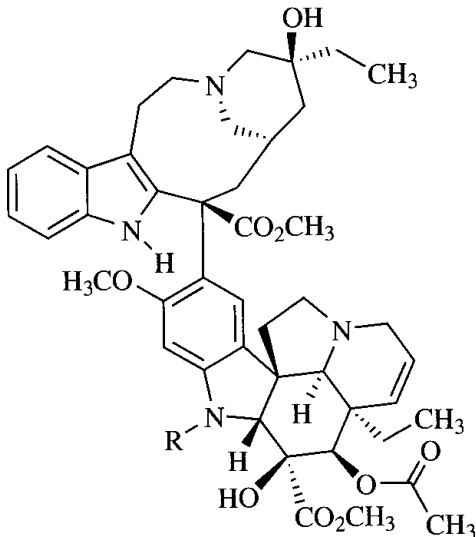
# Madagascar periwinkle, *Catharanthus roseus*, Apocynaceae, Madagascar

- Has multiple effects, long believed to be a “magic plant”
- Multiple indole alkaloids like vincristine inhibit cell division in many cancer lines, especially sarcomas

# Madagascar periwinkle



# Vincristine



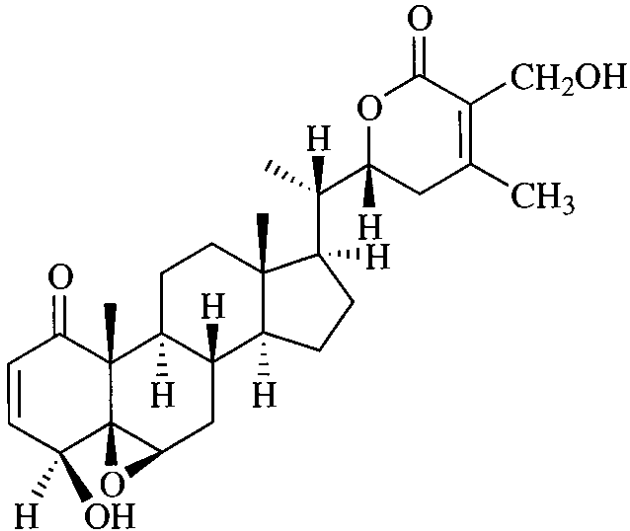
# Ashwaganandha, *Withania somniferum*, Solanaceae, South Asia

- Roots are used in Ayurveda from more than 4,000 years
- Contain different steroidal lactones and alkaloids like withaferin
- Effects are still under research, plant is believed to have sedative and immunostimulating, adaptogene and anti-stress properties

# Ashwaganandha



# Withaferin



# Golden root, *Rhodiola rosea*, Crassulaceae, North Hemisphere

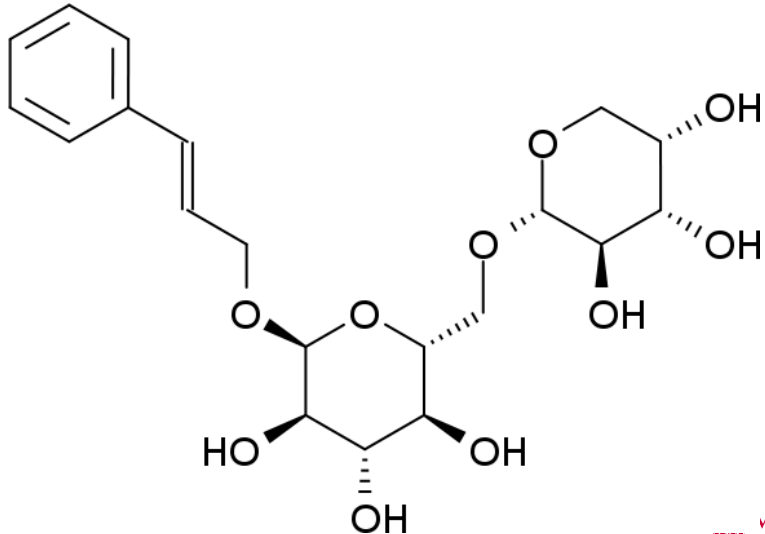
- Traditional plant in Siberian medicine, went to Europe and to TCM
- Roots contain rosavin glycosides
- Have anti-stress, stimulating and adaptogene properties



# Golden root



# Rosavin



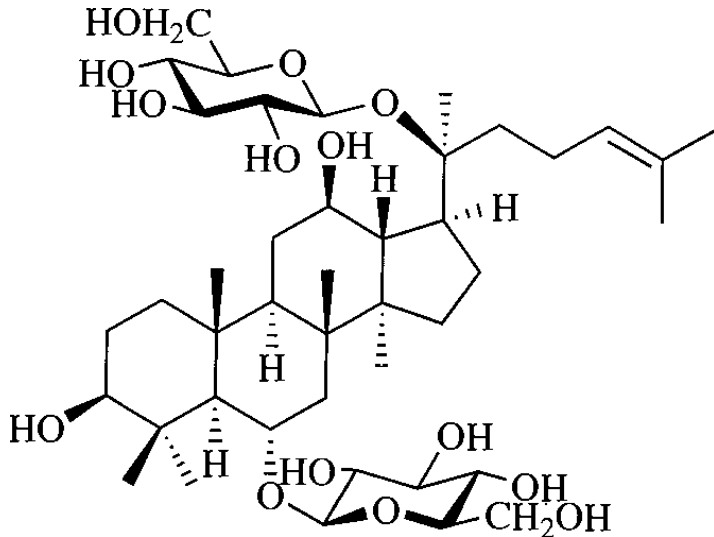
# Ginseng, *Panax ginseng*, Araliaceae, East Asia

- Extremely important TCM plant
- Active components are ginsenosides
- Facilitate metabolism, improve concentration, increase level of adaptation, etc. etc.
- American ginseng (*Panax quinquefolius*) and Siberian ginseng (*Eleutherococcus senticosus*) contain similar compounds

# American ginseng



# Ginsenoside



# Gotu kola, *Centella asiatica*, Araliaeae, South Asia

- Traditional Ayurveda plant, belongs to “rasayana”
- Contains multiple glycosides (centelloside etc.) which have immunostimulatory and sedative effects

# Gotu kola



# Reishi (Lingzhi) mushroom, *Ganoderma* spp., Polyporaceae, East Asia

- Important component of TCM, “fungus of immortals”
- Triterpenes (like ganoderic acids) have general tonic and cholesterol-lowering effects



# Lingzhi



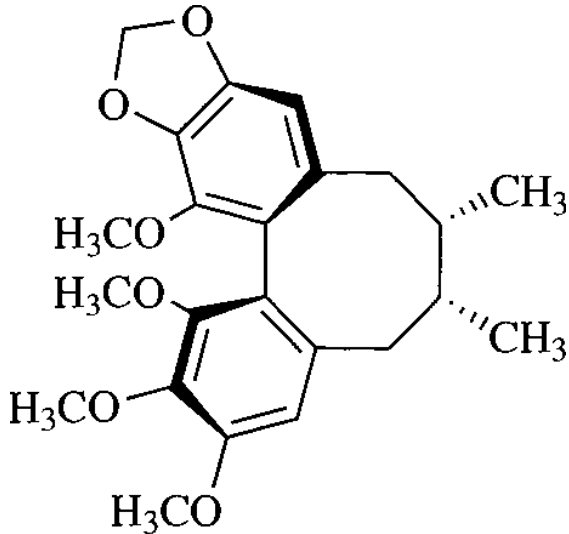
# Magnolia vine, *Schisandra sinensis*, Schisandraceae, East Asia

- Berries contain lignans like schizandrin
- In TCM, it is believed to prolong life via increasing the “vital energy”
- Clinical investigations provide some support for antioxidative, brain-stimulating and even anti-cancer activities

# Magnolia vine



# Schizandrin



# Prickly plants

- Bear thorns, spines or prickles
- Cactaceae (like jumping cholla, *Cylindropuntia fulgida*), many Rosaceae (like hawthorn) and some Leguminosae (like *Gleditschia*)
- Sometimes useful for “live hedges”

# Jumping cholla spines



# Gleditsia thorns



# Measuring spineness of blackthorn





# 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 amd phytotherapy* (selected chapters). [Electronic resource].

Churchhill 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)

**Chapters 23–24 and 8.**