

# Ethnobotany. Lecture 18

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# Outline

- 1 Rosaceae fruits
  - Rosaceae with pome fruits (end)
- 2 Other temperate and subtropical fruits
  - Citrus and related genera
  - Important tropical fruits

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  - Rosaceae with pome fruits (end)
- 2 Other temperate and subtropical fruits
  - Citrus and related genera
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# *Sorbus* spp., mountain ash

- Large (up to 200 species) genus occurred in North America and Eurasia
- Most species have edible fruits
- European rowan (*Sorbus aucuparia*), and common whitebeam (*Sorbus aria*) are main cultivated species (also as ornamentals)
- Fruits are mostly used for wines, jams and jellies; bitter taste is normally gone after first frosts

# European rowan



# *Crataegus* spp., hawthorn

- More than 200 species of shrubs and small trees from Eurasia and North America
- Many species are cultivated for their fruits and also as ornamentals, for aroma compounds and/or as tea surrogate
- Used in multiple traditional medicine practices, one proven use is treating chronic heart diseases

# Hawthorn fruits



# Citrus and related genera

- Belong to Rutaceae, ruta family, often treated as separate subfamily, Aurantioideae
- East Asian and/or Indonesian origin
- Have specific **hesperidium** fruit with flavedo exocarp, albedo mesocarp and membrane endocarp covered with juicy hairs

# Trifoliolate, *Poncirus*

- Spiny, hardy citrus, with compound leaves, growing even in warm temperate regions
- Used as a rootstock for grafting other species
- Fruits are bitter but contain vitamins and microelements

# *Poncirus trifoliata*



# Orange, *Citrus sinensis*

- Covered in presentation
- To add: mostly subtropical (not tropical) culture
- Also used as a rootstock for other species (e.g., grapefruit)

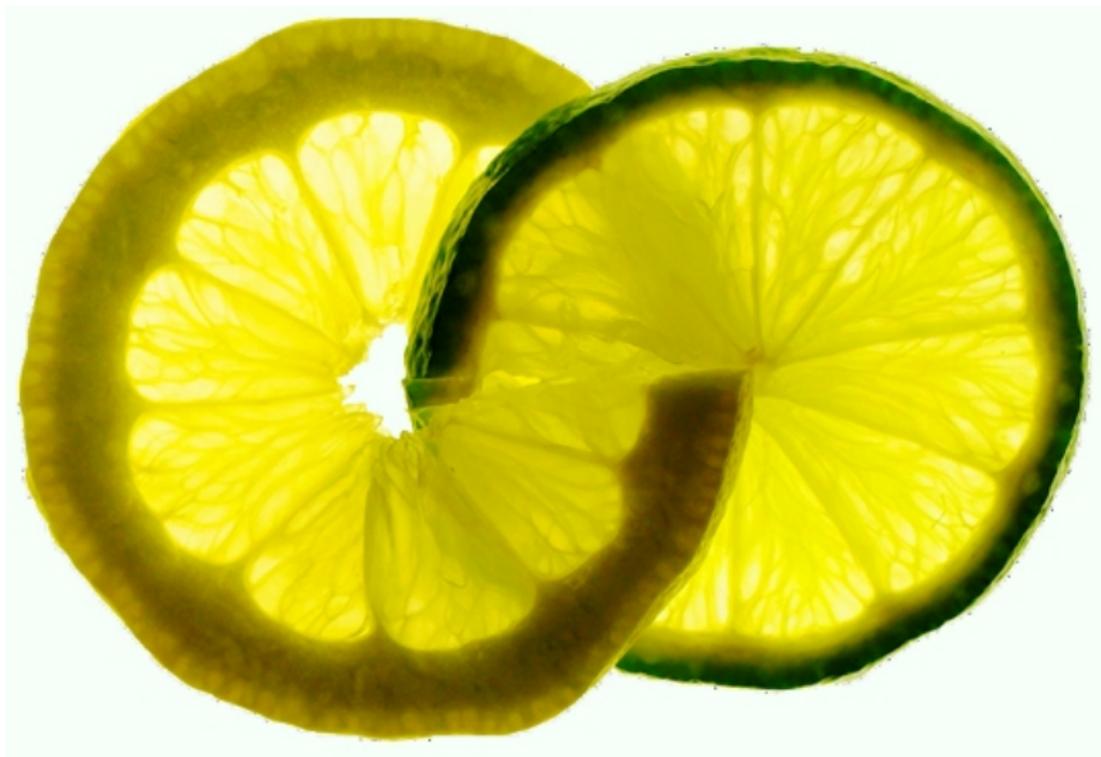
# Lemon, *Citrus limon*

- Relatively big (4–6 m) spiny trees
- Flowers continuously
- Sour citrus, fruits contain up to 8% of lemon acid
- Introduced to Europe in 1000s

# Lime, *Citrus aurantifolia*

- Pure tropical culture, damaged even with small frost
- Originated from Malaysia, but culture started in Caribbean
- Flavedo is green and thin; aroma compounds different from lemon

# Lemon and lime



# Mandarin, *Citrus reticulata*

- Extremely variable species, with multiple cultivars and hybrids
- Multiple names: tangerine, clementine, satsuma, unshiu
- Small trees or even shrubs, some forms (unshiu) are hardy; all require humid climate

# Mandarin



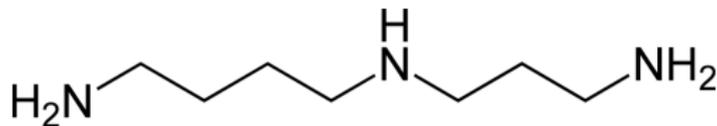
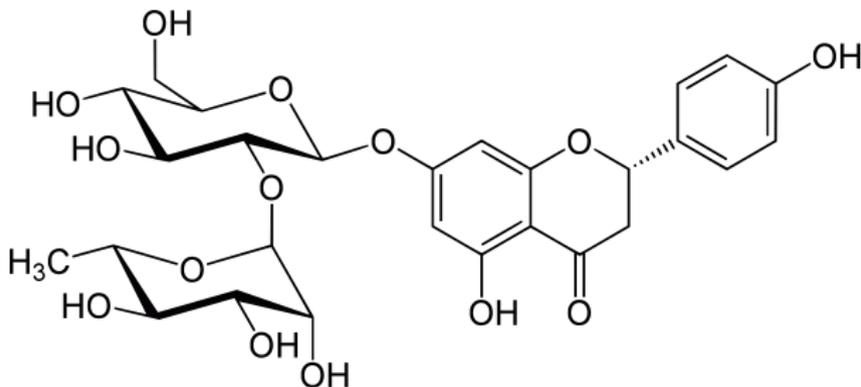
# Grapefruit, *Citrus* × *paradisi*

- Originated in 1750 in Barbados, most probably as a hybrid between orange and pomelo (*Citrus maxima*)
- Cultivated mostly in USA and Caribbean countries
- Big tree, fruits larger than orange, with bitter taste due to naringin, the glycoside with digestive, tonic and anti-atherosclerotic effects
- Also contains significant amounts of vitamins B and polyamine spermidin (which is known to increase lifespan of different laboratory animals)

# Grapefruit



# Naringin and spermidine



# Pomelo, *Citrus maxima*

- Pomelo, shaddock (by name of captain Shaddock who brought it to Caribbean) is widely cultivated in Thailand and neighboring countries
- Largest citrus (up to 15 m), fruits also large, up to 3 kg, contain naringin
- Tropical culture, may be cultivated even on seashores

# Pomelo



# Bitter orange, bergamot orange, *Citrus aurantium*

- Used mostly as a source of strong aroma compounds
- Also known as appetite suppressant
- Component of different liquors and Earl Gray tea

# Bitter orange



# Citron, *Citrus medica*

- Have large but bitter fruits
- Flavedo is thick, used for candies
- Historically, was first citrus cultivated in Europe
- Famous “Buddha’s hand” is *Citrus medica* var. *sarcodactylis*

# “Buddha’s hand” citron



# Kumquat, *Fortunella* spp.

- Small evergreen trees from other genus (*Frotunella*) and 4 cultivated species, all from East Asia
- Sour fruit with sweet skin
- Widely hybridize with other citrus species

# Kumquat



# Banana, *Musa acuminata*

- Belongs to Musaceae family of monocots
- Genus contains 11–13 species, all tropical
- Cultivated forms are seedless triploids with AAB genome, where “A” is a wild *Musa acuminata*, and “B” is *M. balbisiana*
- Fruits are rich of carbohydrates, vitamins of B group, iron and potassium

# Wild diploid banana with seeds



# Banana biology

- Perennial herbaceous (!) plant with large underground rhizome
- Rhizome produce groups of leaves with connected axils (pseudo-stem)
- Inflorescence will grow through pseudo-stem and produce up to 3,000 flowers, male and female
- Wild forms are often bird-pollinated, cultivated forms are parthenocarpic

# Banana corms



# Banana flowers



# Banana agriculture

- Propagated with slices of rhizome (corms)
- Initial growth of pseudo-stem is 5–6 months, then fruits appear after 2–3 month
- Critical to humidity (must be high) and soil richness (planted often on burnt forest plantations)

# Banana plantation



# Banana history

- Probably originated in southeast Asia and then distributed across the world before age of exploration
- Two main cultivar groups selected: fruit bananas and plantains (vegetable, starch-containing bananas)
- Biggest producers are India, Philippines and China

# Mango, *Mangifera indica*

- **Covered in presentation**
- To add: low fertilization rate, from hundreds of flowers only few produce fruits
- Plant of monsoon climate: requires both dry and humid season

# Summary

- Citrus is a group of genera with no wild species; different species and even genera can hybridize almost freely
- Banana is a giant perennial herbaceous plant with no true aboveground stem

# 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)



P. M. Zhukovskij.

*Cultivated plants and their wild relatives* [Electronic resource].

Commonwealth Agricultural Bureaux, 1962.

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zhukovskij1962\\_cultivated\\_plants.pdf](http://ashipunov.info/shipunov/school/biol_310/zhukovskij1962_cultivated_plants.pdf)

**Pages 28–74.**