

# Ethnobotany. Lecture 16

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# Outline

## 1 Fruits: Introduction

## 2 Fruit plants

- Rosaceae fruits

# Outline

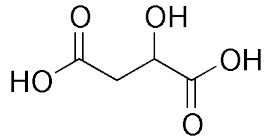
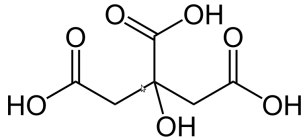
## 1 Fruits: Introduction

## 2 Fruit plants - Rosaceae fruits

# Organic acids

- Malic (*Pyrus malus*, apple and other Rosaceae fruits)
- Citric (*Citrus* fruits etc.)
- Tartaric (e.g., in wine)
- Are good antioxidants

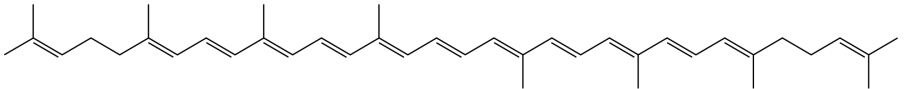
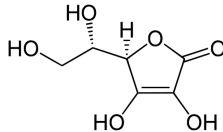
# Citric and malic acids



# Fruit vitamins

- Vitamin C (ascorbic acid)
- Pro-vitamin A ( $\beta$ -carotene)
- Other carotenes (lycopene etc.)

# Ascorbic acid and lycopene

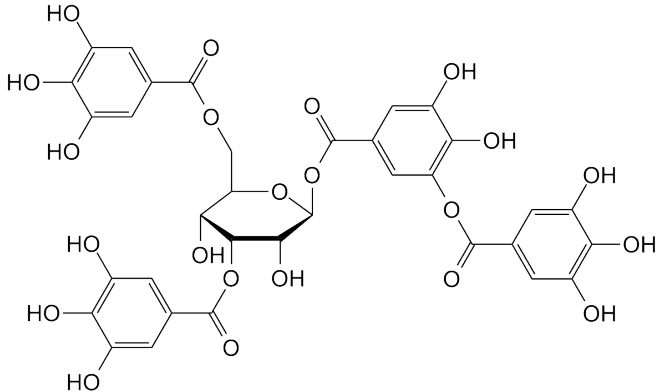


# Specific components which are restricted to few species

- Lipids
- Starch
- Gums, mucilages, pectins
- Astringent chemicals (e.g., tannic acid)
- Aroma compounds
- Other secondary\* metabolites (latex, alkaloids, glycosides)



# Tannic acid



# Rosaceae in general

- Medium-sized family ( $\approx 3,000$  species) of small trees, shrubs and herbs from subtropical and temperate regions
- Flower contains numerous stamens (secondary multiplied), free pistils and hypanthium
- Fruit is mostly fleshy

# Rosaceae groups

- Rosoideae—herbs or shrubs, leaves often compound, receptacle large, fruit aggregate
- Spiraeoideae—shrubs or trees, leaves simple, receptacle small, fruit often monomerous
- Maloideae—trees, leaves simple, receptacle and pistils fused

# Rosaceae with multiple (aggregate) fruits

- Most primitive group
- *Rosa* is ornamental and medicine plant
- *Rubus* and *Fragaria* are also widely cultivated

# Rubus

- Biennial semi-shrubs, sometimes herbs
- Multiple wild species, only two are widely cultivated: raspberry (*Rubus idaea*) and blackberry, *Rubus caesius* forms and hybrids

# *Rubus* features

- Two aboveground stem types: primocane and floricanes, plus underground rhizomes
- Tangled genetic systems: apomixis, polyploidy and even permanent pentaploidy ( $2n = 35$ )
- Fruits contain (among other) salicylic acid and different antioxidants

# Blackberries on the different stages or ripening



# *Fragaria* × *ananassa*, strawberry

- Octoploid ( $2n = 56$ ) hybrid species of two other octoploid strawberries, *Fragaria virginiana* from North America and *F. chiloensis* from Chile.
- Garden hybrid, first occurrences are from  $\approx 1740$
- Herb with runner stems and accessory multiple nut fruit (the edible part is a receptacle)



# Strawberry features

- Susceptible to multiple diseases, often cultivated in semi-artificial conditions as plasticulture
- Cultivated as annual or perennial
- Long-day cultivars flower early in May and capable to produce fruits in June

# Plasticulture of strawberries



# Summary

- Rosaceae is one of the most important temperate fruit families
- Most of Rosaceae cultivated fruits are result of long selection involved multiple hybridization

# 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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