

# Ethnobotany. Lecture 3

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# Outline

- 1 Main food source plants: grains
  - Introduction to grasses
  - Wheat (Triticum)



# Reference books

Reference “Heinrich et al. 2012. Fundamentals of Pharmacognosy and Phytotherapy”: check the bookstore next week.



# Main food source plants: grains

## Introduction to grasses



# Triticeae tribe

- Tribe is a taxonomic group which is bigger than genus but smaller than family
- Triticeae are small-sized grasses with one spike per stem, spike scales with long awns, caryopses rounded, contain high percent of starch and little amounts of proteins
- Several wild genera (most important are *Aegilops* and *Agropyron*: bluegrass and wheatgrass), and cultivated **wheat** and **rye**



# Main food source plants: grains

Wheat (Triticum)



# Main features

- One of three most important plants ever
- 30% of world grains
- Yield is up to 2.4 tonnes/hectare (2,400 kilograms per 10,000 m<sup>2</sup>); Guinness book record is 21 ton/ha (New Zealand, 2010)
- Main source of breads and bread-like products (similar products from other grains are growing hard much faster mostly because of more proteins)
- 70-75% of hydrocarbonates (starch) and 10% of proteins; 100 g give  $\approx$  350 calories
- However, wheat is not a rich source of lysine (indispensable amino acid), therefore, it is important to eat protein sources if menu is rich of wheat (pizza!)



# Morphology of wheats

- Annuals, root system of secondary and especially adventive roots
- From 1–6 long stems with spikes per plant
- Flowers have 3 stamens
- Both wind- and self-pollinated
- Genus has more than 20 species



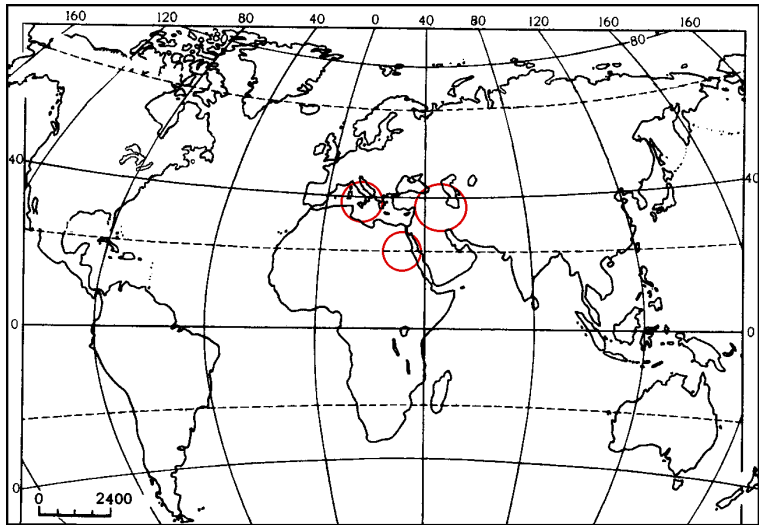


# History of cultivation

- One of the most ancient cultivated plant, first traces date  $\approx$  6–7,000 yr ago
- Main centers: West Asia (Iran, Mesopotamia and Caucasus) and ancient Egypt
- During the history, “ancient” species (like eincorn) cede to “modern” species (like hard wheat)



# Centers of wheat origin and cultivation



# Features of wheat agriculture

- Wheats are well adapted to relatively dry regions, with amount of precipitation 600–800 mm per year (sometimes survive even with 400 mm)
- Easily endure small (!) droughts
- Temperatures for flowering should be in 18–28° C range; seedlings may survive under a snow; do not like high temperatures and do not give high yield in tropics (however, do not grow well in cold regions)
- Most critical for cultivation is the soil quality: should be light, well-aerated, rich of nitrogen (this is why wheats grow better after legumes)



# Species and species groups

- Diploid species ( $2n = 14$ ): einkorn
- Tetraploid species ( $2n = 28$ ): emmer wheat, hard wheat
- Hexaploid species ( $2n = 42$ ): common wheat

Common wheat is a “genetic monster” with the chimeric genome.



# Summary

- Wheats (*Triticum*) are ancient cultivated plants, originated in West Asia
- Tetraploid and hexaploid wheats are intergeneric hybrids



# For Further Reading



P. Stamp.

*Virtual cereal cultivar garden* [Electronic resource].

2008.

Mode of access:

<http://www.sortengarten.ethz.ch/?content=start>



A. Shipunov.

*Ethnobotany* [Electronic resource].

2011—onwards.

Mode of access:

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

