

# Ethnobotany. Lecture 7

Alexey Shipunov

Minot State University

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# Outline

- 1 Main food source plants: grains
  - Rice
- 2 Lesser C<sub>3</sub> grasses
  - Indian rice, *Zizania*



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# Main food source plants: grains Rice



# Rice (*Oryza sativa*)

- Belongs to the tribe Oryzeae
- Has panicle as an inflorescence, flowers with 6 stamens (uncommon in grasses)
- More than half of human population use rice as a main food source
- Cultivated mostly in tropics and subtropics, below 42° latitudes



# Rice features

- High calories (360 cal / 100 g), up to 10% of proteins, including lysine amino acid (!)
- White (polished) rice does not contain embryo and therefore deficient of many vitamins; beriberi disease is a deficiency of vitamin B<sub>1</sub> (thiamine) originated in richer families of Indonesia (because they were wealthy enough to buy a “better” rice)
- Rice is not used for bread, if cooked it become extremely brittle
- Yield is much higher than wheat,  $\approx$  6 ton/hectare!
- Rice is a coastal plant, requiring water, especially when young; seedlings are often manually planted in the soil covered with water
- Ancestrally, rice requires monsoon climate: first season is wet (rice germinates), second is dry (rice matures)



# Rice taxonomy

- 28 species, only one is widely cultivated: *Oryza sativa*, common rice
- Several main varieties, including Japanese (short-grain) and Indian (long-grain) rice. Japanese variety has sticking (high proteins) and non-sticking forms.



# Rice origin and history

- First remains (Thailand) are 7,000 BC; mass cultivation started in East Asia 4–5,000 BC
- Most probably, perennial *Oryza perennis* is a wild relative of cultivated rice
- Came to Europe with Arabs in first millennium
- From 1865, is cultivated in U.S. (first plantations in North Carolina)
- After the “Green Revolution” in 1960s, genetically modified rice cultivars allow to finish hunger in India and China





# Rice agriculture

- Seeds are germinated in nurseries
- After several weeks, seedling are transplanted (often manually) to flooded fields
- Water should be removed after 1–2 month from transplanting
- There are also “mountain” rice which does not require flooding (but its yield is less)



# Common rice, *Oryza sativa*



# Rice flower



# Ancestor of rice, *Oryza perennis*



# Lesser C<sub>3</sub> grasses

## Indian rice, *Zizania*



# Indian rice, *Zizania*

- Small (3 species) genus of water grasses distributed in East Asia and North America
- Big (up to 1.5 m), partly submerged grasses with unisexual flowers
- Inflorescences are panicles
- Long grains



## *Zizania aquatica*, or manoomin

- Only one species was used by Native Americans
- Odjibwe name “manoomin”, Dakota name “psi”
- Half-cultivated (supported but not planted)
- Stems tied (precaution against birds), then harvested from canoe



# Ricing, step 1





## Ricing, step 2



## Ricing, step 3



## Ricing, step 4



## Ricing, step 5: threshing



## Ricing, step 6



# Summary

- **Rice** is the old culture with extremely complicated agriculture but high yield



# Summary

- **Barley** is an ancient culture well adapted to agriculture in mountain regions
- **Rye** and **common oat** were originated from weeds



# 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)

