

# Ethnobotany

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Lecture 8

# Outline

- 1 Main food source plants: grains
- 2 African C<sub>3</sub> and C<sub>4</sub> grains
  - *Digitaria exilis*, fonio
  - *Eragrostis tef*, tef

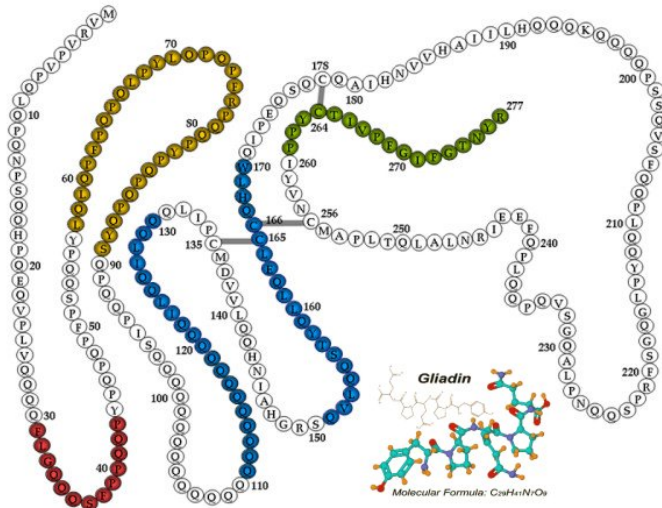
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# Gluten and celiac disease

- Gluten (grain proteins) of Triticeae includes prolamines—storage proteins
- They work against insect alpha-amylases making seeds virtually inedible for insects
- They also weaken tight junctions in the gut epithelial cells and cause celiac disease, auto-immune inflammation of gut epithelium
- However, the last also suppress bacterial infections so there is a positive selection for gluten sensitivity
- Finally, it is impossible to knead dough without glutes...

# Gliadin motifs which cause celiac disease



# African C<sub>3</sub> and C<sub>4</sub> grains

*Digitaria exilis*, fonio

# *Digitaria exilis*, fonio

- Main crop of West Africa
- The only cultivated species of big ( $\approx 300$  species) genus *Digitaria*
- Low, heavily branched grasses
- Grains are extremely small (2–3 mm); however, the yield is comparable with primitive wheats (0.6–1 ton/ha)

# Fonio agriculture

- Well adapted to short days, high temperatures and low precipitation
- Needs only surface development of soil, planted by scattering
- Manual harvesting and threshing



# Fonio



# Fonio threshing



# Fonio grains



# African C<sub>3</sub> and C<sub>4</sub> grains

*Eragrostis tef*, tef

## *Eragrostis tef*, or tef

- One of the main cultures of East Africa
- Used for making bread
- Small, branching plants with small spikelets and grains
- Grains are rich of iron (used also for medical purposed, for treating anemia)
- Well adapted to high altitudes
- Yield is comparable with rye ( $\approx$  1 ton/ha)

# Tef



# Tef grains



# 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)