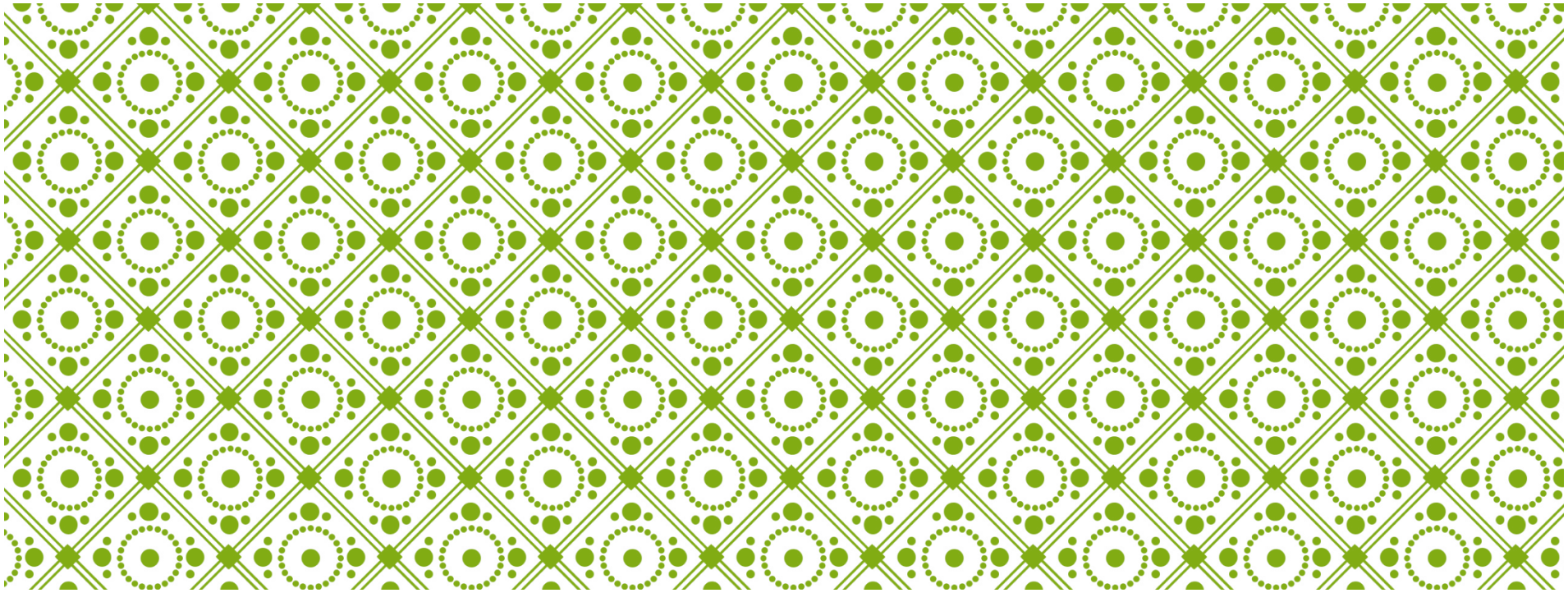


KOMBUCHA

An example of bacterial/yeast fermentation

M. Cambo

WHAT IS KOMBUCHA?

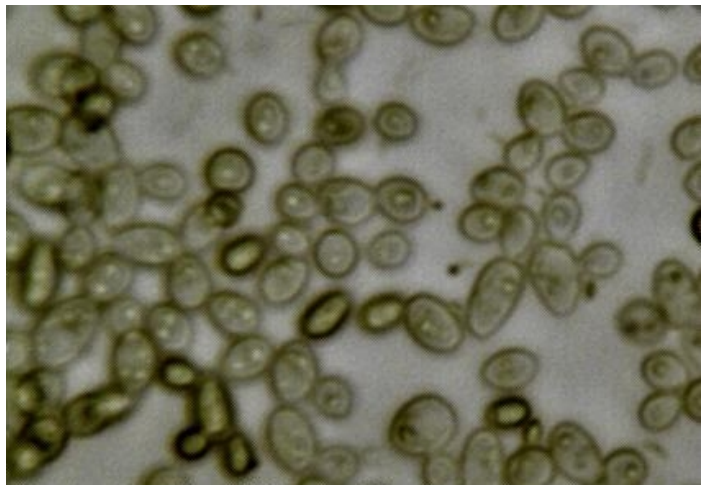
- Fermented tea that is a nutrient rich tonic
- Cultured from a thick gelantinous mat that rests inside of the tea
- Culture is known as a "SCOBY" or Symbiotic Colony of Bacteria and Yeast
- This culture feeds off the caffeine and sugar creating a sour drink packed with B vitamins, enzymes, probiotics and antioxidants .
- When fermentation is complete there is little caffeine or sugar content.

SCOBY

- Grows to the width of the container
- Over time a “baby” SCOBY (another layer) will form from the mother
- This SCOBY can be split from the mother and used to create another batch of Kombucha
- Acidic environment protects the SCOBY from harmful bacteria, however equipment used to make Kombucha should still be sterilized with distilled vinegar to prevent mold/bacterial contamination

ORGANISMS IN THE SCOBY

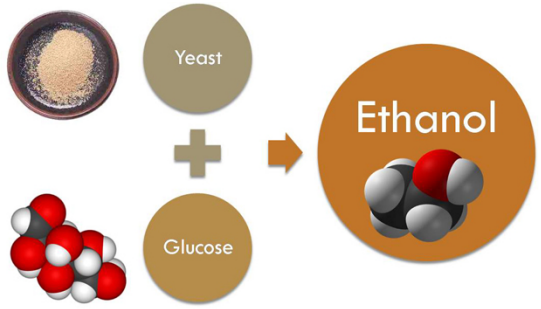
- Unique to Kombucha:
  - *Gluconacetobacter kombuchae*
  - *Zygosaccharomyces kombuchaensis*
- Other possible microorganisms
  - *Gluconacetobacter xylinus*
  - *Saccharomyces cerevisiae*
  - *Brettanomyces bruxellensis*
  - *Candida stellata*
  - *Schizosaccharomyces pombe*
  - *Zygosaccharomyces bailii*



Microorganisms in a SCOBY at 400X

FERMENTATION

- Ingredients required: Tea, Water, Sugar and mother culture (SCOBY)
- SCOBYS are made up of a variety of anaerobic and aerobic microorganisms
- Sucrose + microorganisms → fructose + glucose → gluconic acid + acetic acid



Kombucha Fermentation and Its Antimicrobial Activity
Guttapadu Sreeramulu,Yang Zhu,* and, and Wieger Knol
Journal of Agricultural and Food Chemistry **2000** *48* (6), 2589-2594
DOI: 10.1021/jf991333m

$C_6H_{12}O_6 \rightarrow 2\ C_2H_5OH + 2\ CO_2$

Ingham, Barb. "Safe Preserving: Fermented Foods". *Safe and Healthy: Preserving Food at Home*. N.p., 2013. Web. 25 Jan. 2016.

PRIMARY FERMENTATION (10-14 DAYS)

- Pure black tea is brewed and one cup of sugar is added to tea
- Once tea cools to below 85 degrees F SCOBY may be added
- Container is covered with a cheese cloth and left in a warm (between 70-85 degrees) closet
- During primary fermentation caffeine and sugar in the tea is used

SECONDARY FERMENTATION (2-3 DAYS)

- Once primary fermentation is complete the beverage will no longer be syrupy and will have slight carbonation
- SCOBY is removed
- The beverage is poured into smaller containers and fresh fruit or juice is added
- The containers are placed in a warm location for an additional 2-3 days giving the microorganisms present in the liquid time to ferment the additional added sugars
- Once secondary fermentation is complete the result will be a carbonated slightly sweet/sour beverage

KOMBUCHA! READY TO DRINK!