SENSORY SUMMIT

A COFFEE SENSORY SCIENCE EVENT

Zurich University
of Applied Sciences

Life Sciences and
Facility Management

Review and Sensory Potential of ‘wild’ Coffee Species

Part B - analytical part

ZHAW Zurich University of Applied Sciences, Life Sciences und Facility Management,
Grüental, P.O. Box, 8820 Wädenswil/Switzerland, Phone +41 58 934 59 69, weiterbildung.lsfm@zhaw.ch

Cupping code

4 *Arabica:* *Coffea arabica*


2 *Robusta:* *C. canephora*


3 *Eugenioides:* *C. eugenioides*


1 *Liberica:* *C. liberica*


5 *Excelsa:* *C. liberica* var. *dewevrei*


6 *Racemosa:* *C. racemosa*


Images from: A database of Wild Coffea Species (https://doi.org/10.23708/JZA8I2).

ZHAW Zurich University of Applied Sciences, Life Sciences und Facility Management,
Grüental, P.O. Box, 8820 Wädenswil/Switzerland, Phone +41 58 934 59 69, weiterbildung.lsfm@zhaw.ch

Liberica

Image credit: beanshipper.com

Jason Liew, Malaysia
Grown at 0 – 35 masl
Harvest in Jan 2022

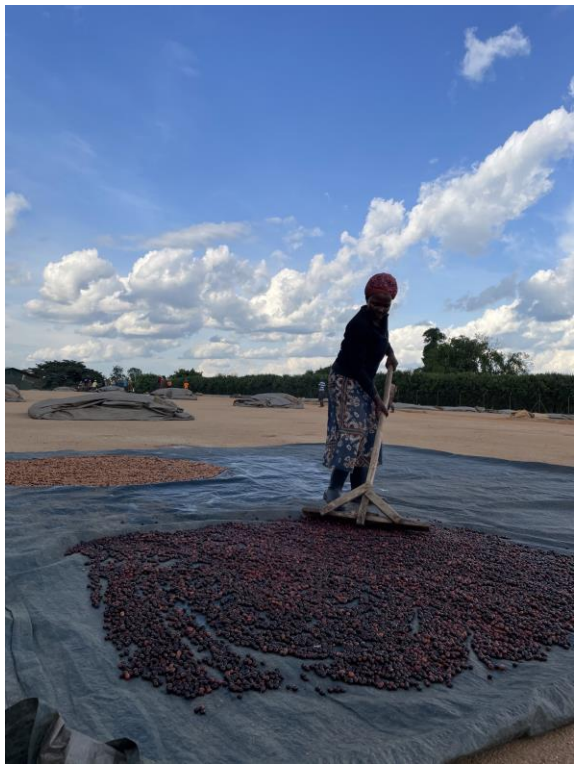
Image credit: ONA coffee

Handpicked and sorted cherries
Anaerobic natural (CM) for **20 days**
30 days drying in closed environment with dehumidifiers.

ZHAW Zurich University of Applied Sciences, Life Sciences und Facility Management,
Grüental, P.O. Box, 8820 Wädenswil/Switzerland, Phone +41 58 934 59 69, weiterbildung.lsfm@zhaw.ch

Robusta

Kaweri Estate,
Uganda
Grown at 1200 – 1350 masl
Harvest from November - March 2022



Handpicking
Natural / yeast assisted fermentation
Sun dried

ZHAW Zurich University of Applied Sciences, Life Sciences und Facility Management,
Grüental, P.O. Box, 8820 Wädenswil/Switzerland, Phone +41 58 934 59 69, weiterbildung.lsfm@zhaw.ch

Eugenioides

Image credit: Inmaculada

Inmaculada coffee farm in Pichinde, Valle de Cauca, Colombia
Grown at 1900 – 2000 masl
Harvest from May to July 2022

Image credit: Inmaculada

Manual hand sorting of cherries
Anaerobic natural (CM)
15 to 20 days drying on raised beds

ZHAW Zurich University of Applied Sciences, Life Sciences und Facility Management,
Grüental, P.O. Box, 8820 Wädenswil/Switzerland, Phone +41 58 934 59 69, weiterbildung.lsfm@zhaw.ch

Arabica (´Parainema´)

Image credit: Sanjonia Estate

Sajonia Estate,
Nicaragua
Grown at 1100 masl
Harvest from November - March 2022

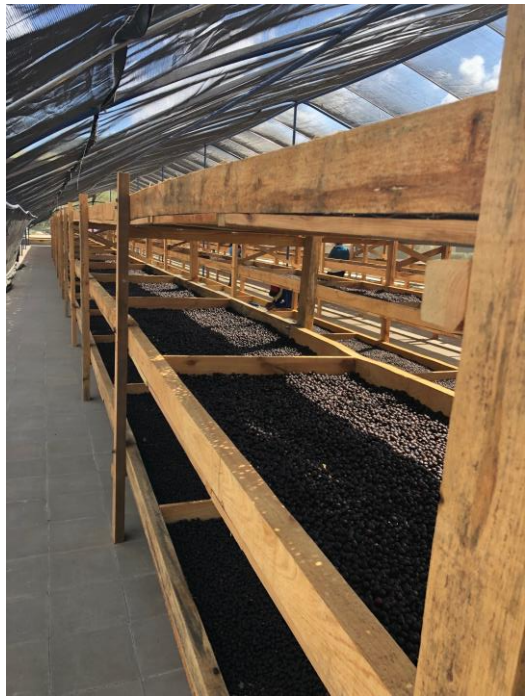


Image credit: Sanjonia Estate

Manual hand sorting of cherries
Anaerobic natural (CM) with **3 days** fermentation Drying for 28 to 30 days on raised beds under shade

ZHAW Zurich University of Applied Sciences, Life Sciences und Facility Management,
Grüental, P.O. Box, 8820 Wädenswil/Switzerland, Phone +41 58 934 59 69, weiterbildung.lsfm@zhaw.ch

Excelsa

Various smallholders,
Uganda/South Sudan
Grown at 1,000 masl
Harvest December to April 2022

Manual harvesting
Sun-dried on raised beds (naturals)
for 14 to 18 days
No grading; hand sorting only

Racemosa

Image credit: Marlene and Frans Cathey

Sukkot farm from Zululand,
South Africa
Grown at 100 masl
Coffee harvest from December - January 2022

Image credit: Marlene and Frans Cathey

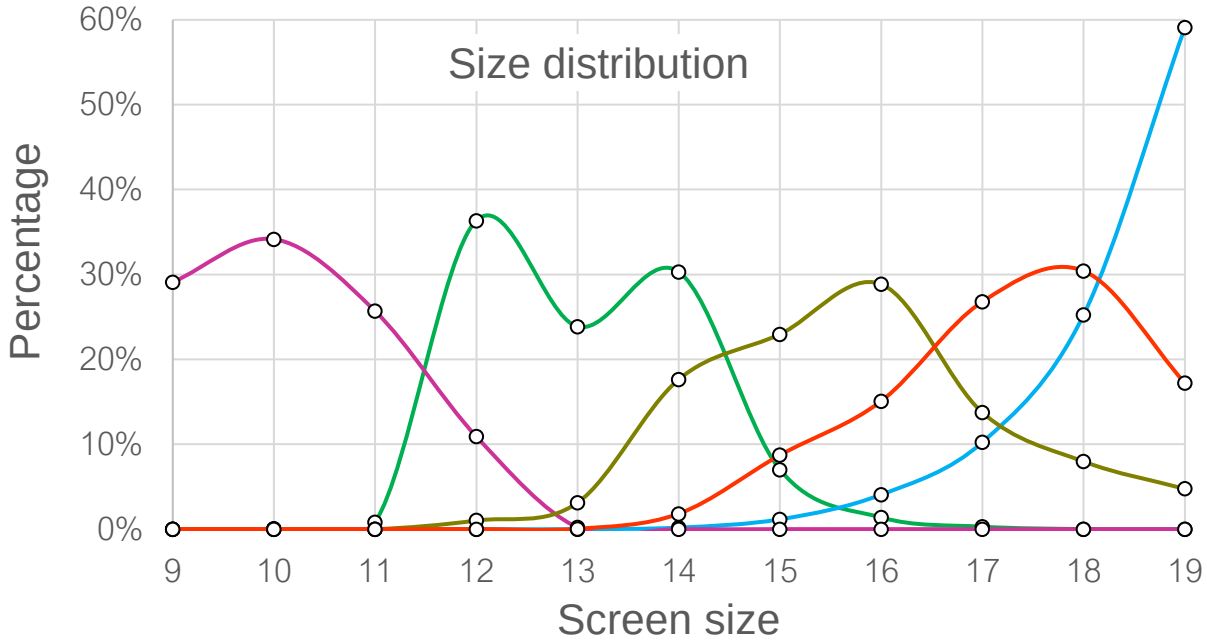
Coffee cherries were handpicked
Washed process
Dried for 2 weeks

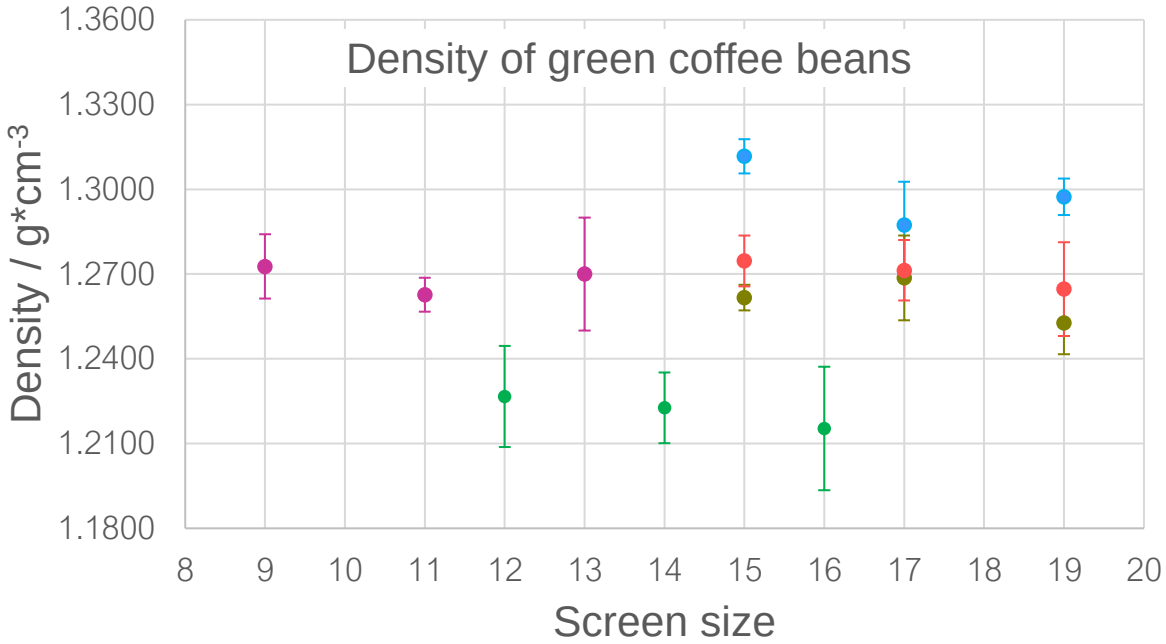
ZHAW Zurich University of Applied Sciences, Life Sciences und Facility Management,
Grüental, P.O. Box, 8820 Wädenswil/Switzerland, Phone +41 58 934 59 69, weiterbildung.lsfm@zhaw.ch

Green coffee analyses

Physical parameter
Green bean composition
Green bean volatiles

The green beans are different





Moisture content

Eugenioides	10.6 % MC
Liberica	9.7 % MC
Racemosa	11.7 % MC
Robusta	10.2 % MC
Arabica	10.7 % MC

Screen sizes of coffees with different maxima from screen size 10/64 inch to 19/64 inch

Higher density for Liberica coffee (but driest coffee), lowest density for Eugenioides coffee

ZHAW Zurich University of Applied Sciences, Life Sciences und Facility Management,
Grüental, P.O. Box, 8820 Wädenswil/Switzerland, Phone +41 58 934 59 69, weiterbildung.lsfm@zhaw.ch

How to analyse and combine complex data?

Problem:
We have analysed many different components of green coffee beans, e.g. titrable acidity, organic acids, fat content, protein content, chlorogenic acids, caffeine etc.
How to visualize?

Solution:
Principal Components Analysis, or PCA, is suitable to tackle a lot of data. PCA reduces the data to two dimensions and 2D is easy to plot as scatter plot to look for structure in your data.

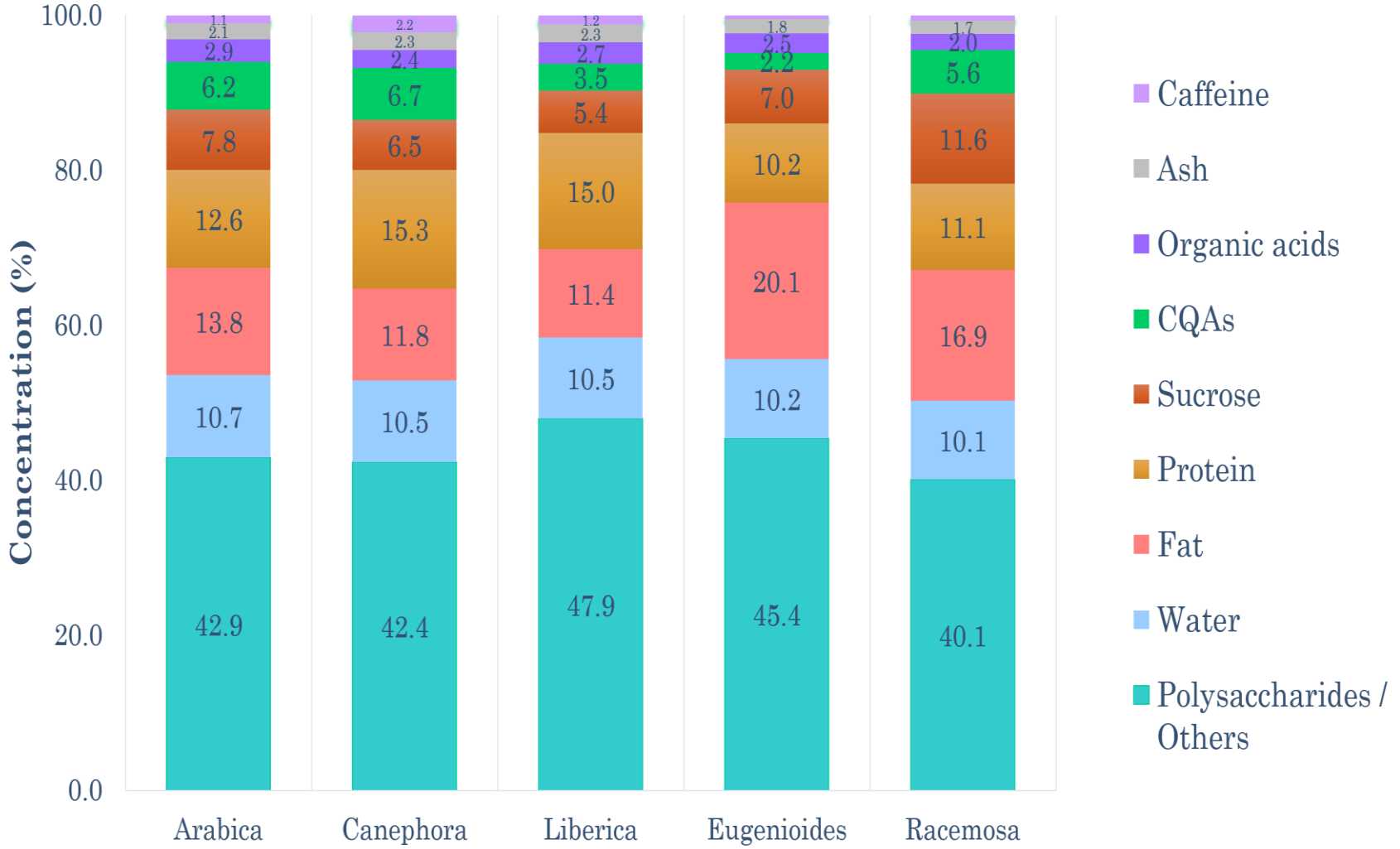
X dimensions

Reduction!

2 dimensions or two principal components

ZHAW Zurich University of Applied Sciences, Life Sciences und Facility Management,
Grüental, P.O. Box, 8820 Wädenswil/Switzerland, Phone +41 58 934 59 69, weiterbildung.lsfm@zhaw.ch

No qualitative, but quantitative differences



Data not from the coffees here at Sensory Summit!

- Lowest values of caffeine in Racemosa and Eugenioides
- Highest values of fat content in Racemosa and Eugenioides
- Lowest values of chlorogenic acids in Eugenioides
- Highest values of sucrose in Racemosa

ZHAW Zurich University of Applied Sciences, Life Sciences und Facility Management,
Grüental, P.O. Box, 8820 Wädenswil/Switzerland, Phone +41 58 934 59 69, weiterbildung.lsfm@zhaw.ch

Green bean

Anaerobic naturals emit different volatiles than washed coffees. Difference is magnified through fermentation.
Green becomes brown bean!

Coffee species are different in their composition. Some indications in composition that could affect sensory perception, e.g. relative content of organic acids, but also caffeine and chlorogenic acid content.

Roasted bean

Difference in aroma compounds

- Process specific compounds, such as ethyl acetate survive the roast process
- Species specific compounds, such as ocimene for Racemosa that can explain the spicy, herbal notes in the coffee.

ZHAW Zurich University of Applied Sciences, Life Sciences und Facility Management,
Grüental, P.O. Box, 8820 Wädenswil/Switzerland, Phone +41 58 934 59 69, weiterbildung.lsfm@zhaw.ch

Thank you for your attention!

Thanks to all the producers and trader for providing the (rare) coffee species!

Thanks to all the team at the Coffee Excellence Center

Please also take a look at the green beans!

Liberica

Robusta

Eugenioides

Arabica

Racemosa

ZHAW Zurich University of Applied Sciences, Life Sciences und Facility Management,
Grüental, P.O. Box, 8820 Wädenswil/Switzerland, Phone +41 58 934 59 69, weiterbildung.lsfm@zhaw.ch

Supported By:

BWT water + more

MAHLKÖNIG

SANREMO COFFEEMACHINES

TONE

algrano

alpro

SUCAFINA SPECIALTY

TODDY cold brewed. simply better.