









# Evaluation of aroma compounds of coffee pulp (*Coffea arabica* L.) fermented with commercial and indigenous yeast

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### Introduction

Coffee pulp, constitutes ~42 % of the cherry is usually discarded, generating pollution, despite its richness in bioactive compounds such as antioxidants, phenols, and caffeine. The objective of this work was to evaluate the volatile and non-volatile compounds formed by fermentations with commercial *S. cerevisiae* yeast (LALLEMAND®) and with indigenous yeast (*Hanseniaspora sp., P. kudriavzevii*) and LAB (*Lpb. plantarum*) isolated from cocoa fermentation, seeking to improve aroma and flavor and generate a functional beverage.

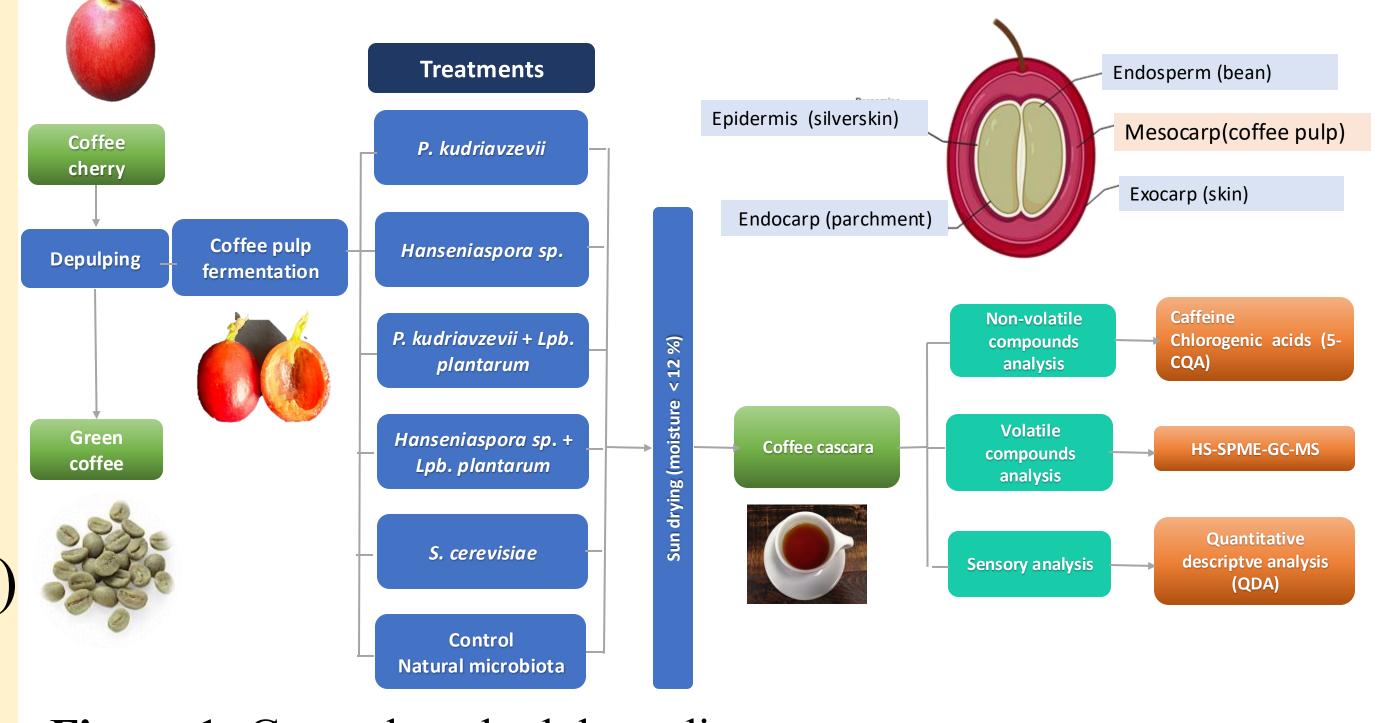
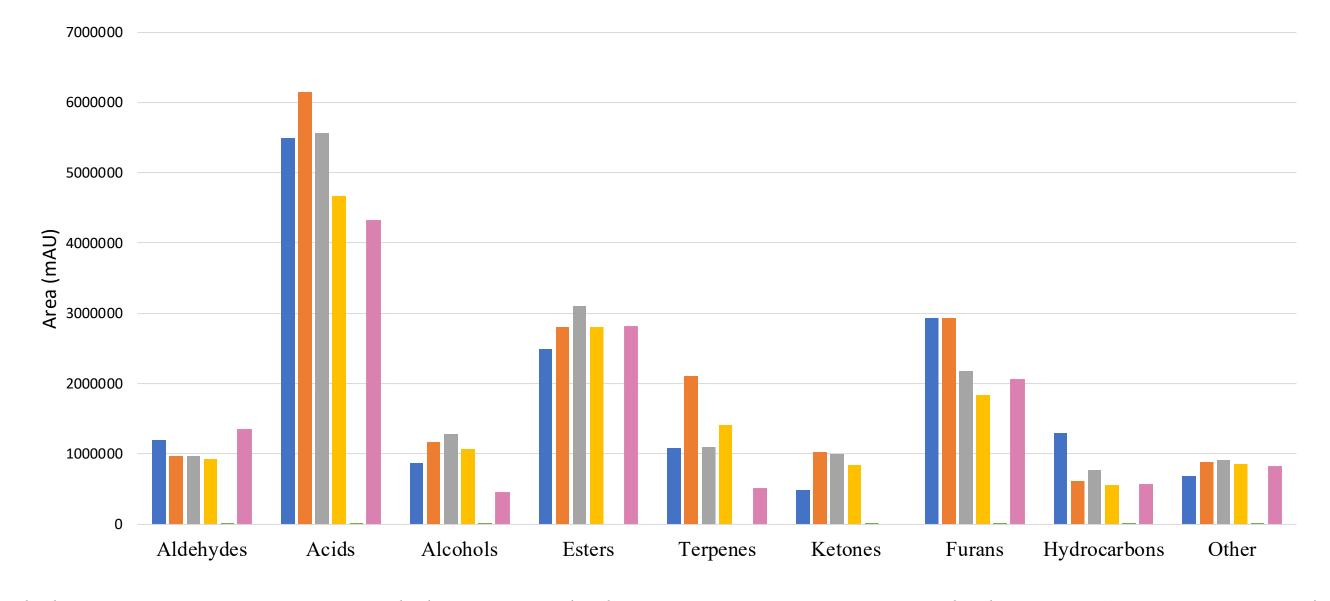


Figure 1: General methodology diagram



■ P. kudriavzevii ■  $Hanseniaspora\ sp$ . ■ P. kudriavzevii+Lpb. plantarum ■  $Hanseniaspora\ sp$ . + Lpb. plantarum ■ S. cerevisiae ■ Control

Figure 2: Average VOCs area per family

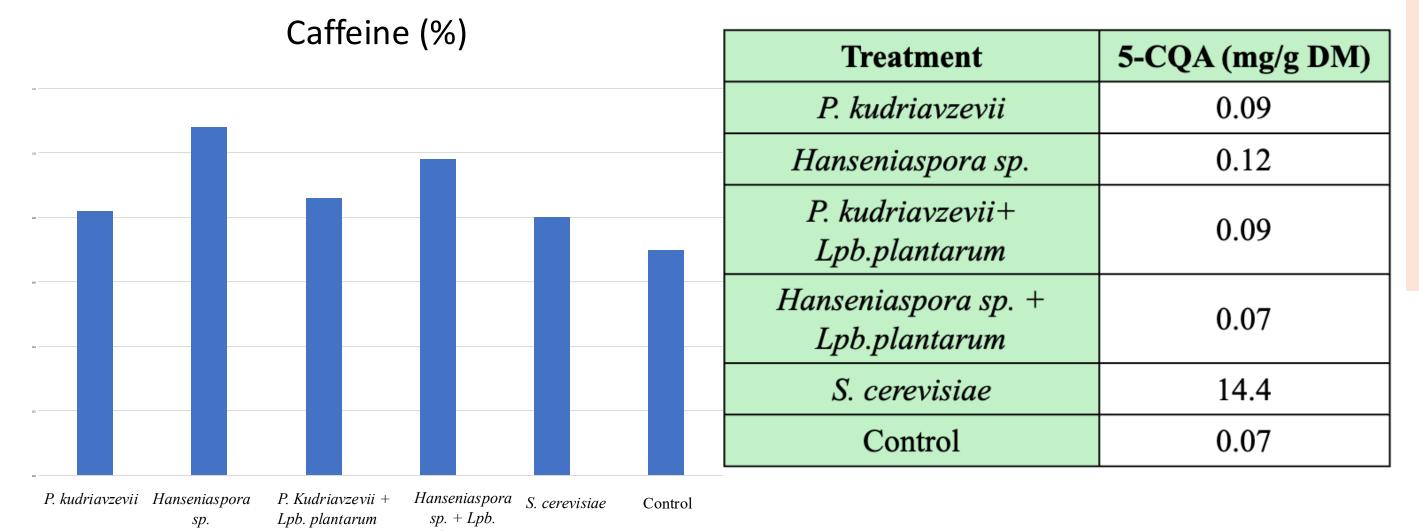


Figure 3: Caffeine and 5-CQA content in the treatments

class	Odour description	Volatile Compound	Spiced 4.5 Aroma quality
Aldehydes	Chocolate	2-methyl-propanal	3.5
	Fermentation	3-methyl-butanal	3 2,5
	Citrus	(E)-2-Decenal	Nutty Ac
	Hibiscus	γ-undelactone	
	Floral	(z)-3-hexenal	0.5
Terpens	Citrus	Limonene	Sweet
	Floral /roses	Geraniol	
	Fruity	Linalool	
Acids	Rancid	2-Methyl propanoic acid	Herbal Astrigen
	Acid	Hexanoic acid	
	Vinegar/ pungent	Acetic acid	Floral Fruity
Alcohols	Fruity	1-octen-3-ol	P. kudriavzevii
	Honey	Phenylethyl alcohol	Hanseniaspora sp.
	Sweet	3,7,11 trimethyl-1-dodecanol	— P. kudriavzevii + Lpb. plantarum
Esters	Mint	Methyl salicylate	— Hanseniaspora sp. + Lpb. plantarum
Furans	Spicy	2(3H)-dihydro-5-methyl-furanone	Control S. cerevisiae

Figure 4: Main odorant notes identified and aroma descriptive analysis

#### Materials/Methods

Five treatments were carried out using 20 kg of fresh coffee pulp inoculated with *S. cerevisiae*<sup>®</sup>, *Hanseniaspora sp.*, and *P. kudriavzevii*. The latter two strains were used to prepare a coculture with *Lpb. plantarum*. A non-inoculated fermentation was used as a control. Fermentation was carried out for 12 h. pH, temperature, and viable count were measured every 4h. Solar drying was then carried out until the moisture content reached approximately 12 %. The dried pulp was analyzed for VOCs by GC-MS to evaluate the aromatic profile of the samples; the caffeine and 5-CQA content was quantified by HPLC. A descriptive analysis of the infusion prepared with the cascara from each treatment was performed.

#### Results/Discussion

A total of 71 different VOCs were identified, 39 – 45 per treatment, highlighting hibiscus (benzaldehyde) and peach (γ-undecalactone) notes in the treatment inoculated with *S. cerevisiae*, citrus (limonene) notes in those inoculated with *Hanseniaspora sp.* and roses (geraniol) and apple (geranium isovalerate) notes in those inoculated with *P. kudriavzevii*. The caffeine content found was less than 1 % for each treatment and 5-CQA was 14.4 mg/g DM in treatment inoculated with *S. cerevisiae* and 0.07 - 0.12 mg/g DM in other treatments and control. Last, about sensory analysis they were found fruity and floral notes, highlighting *S. cerevisiae* treatment.

## Conclusion/Perspectives

The use of fermentations with commercial and indigenous yeasts from cocoa fermentation allows to increase the desirable aromatic notes compared to natural fermentation favoring the obtaining of products with better flavors and aromas, especially *S. cerevisiae* fermentation. It is recommended to increase the fermentation time to observe the effects.

#### References:

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