

IMPACT OF THE USE OF SELECTED YEAST AND BACTERIA IN DIFFERENT PROCESSING METHODS, ON THE FINAL AROMATIC PROFILE OF COFFEE

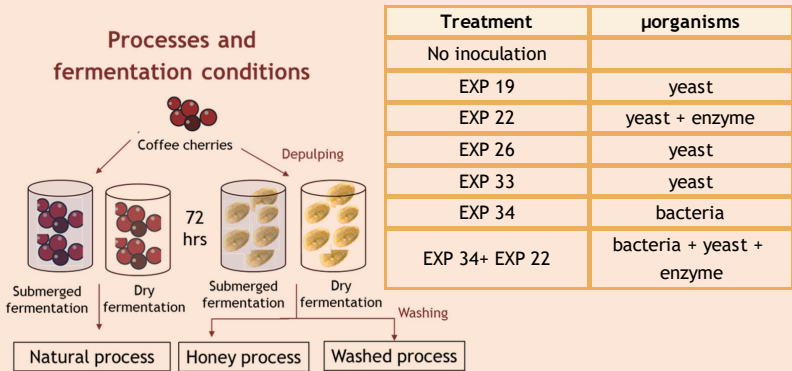
Evelyne Fonchy-Penot, Stéphanie Rollero, Anne Flesch, Marcelo Cerdan

INTRODUCTION

The specialty coffee market has evolved in recent years as new generations of consumers seek new experiences. As a result, innovative fermentation techniques have emerged, integrating them with traditional processing methods to offer greater flavor complexity. New research shows the great diversity of indigenous microorganisms presents on the cherries or in the environment and how it can play a role in the coffee's « terroir ». The use of selected microorganisms can furthermore impact and modulate the coffee flavor and needs to be deeper investigated. The objective of this study is to evaluate the influence of the inoculation of microorganisms during the fermentation of coffee beans.

MATERIALS/METHODS

- Variety:** Castillo, most common Colombian variety, -neutral
- Fermentation follow-up:** Bx, pH, etc.
- Performance assessment:** yield, mucilage degradation levels, defects
- Sensory description** and SCA score



Finally, on the SCA scores, the results figure out that they are upper for the natural process than for the honey process which are itself upper than the washed process. Furthermore, the SCA scores are always upper in dry fermentations than in submerged ones (+0.5 to 1.5 points). Nevertheless, inoculation shows more potential to improve the scores in submerged fermentation in all processes, especially in natural process (84 vs 85.5). The addition of selected microorganisms can also help to expand the range of cup profiles regardless of the fermentation process used. Inoculation can increase the volatile fraction and contribute to a different sensorial coffee experience in regard to fruitiness, the floral or spicy characters, the sweetness perception, but also the acidity profile and the mouthfeel (Fig. 3).

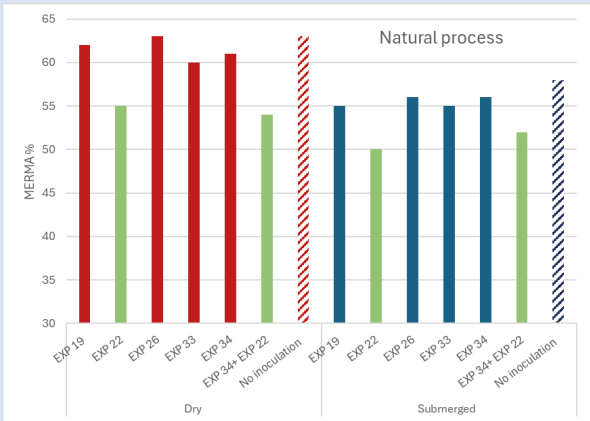


Fig. 2: Impact of the inoculation on the % of defects (MERMA)

RESULTS/DISCUSSION

This study shows that inoculating selected yeast and/or bacteria and/or enzyme can help to improve coffee processing. As example, we can point out the impact of the inoculation on the humidity reached after drying (Fig. 1). Whatever the process considered, at same drying duration, the humidity value obtained after drying seems to be lower if microorganisms are inoculated in comparison to spontaneous fermentation. It could be interesting to improve the shelf life of the green coffee. Moreover, we can notice that the addition of enzymes like pectinases tends to reduce the MERMA (% of loss during drying) in natural processes and consequently have a positive impact on the yields (Fig. 2)

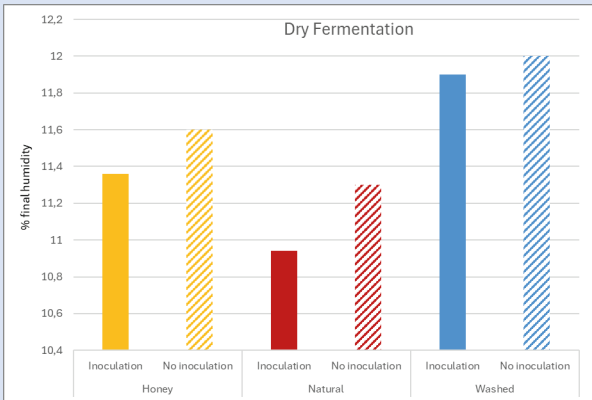


Fig. 1: Impact of the inoculation on the humidity of coffee after drying

EXP 19 - Yeast	EXP 22 - Yeast + Enzyme	EXP 26 - Yeast	EXP33 - Yeast	EXP 34 - Bacteria
6 trials	12 trials	6 trials	6 trials	19 trials
Sweet+ (chocolate, cocoa, cremoso)	Sweet (honey, cocoa, choc, caramel)	Fruity (Orange/Poma/Mora/ Strawberry), wine/gape character	Sweet (Honey, chocolate, caramel)	Fruity (orange, mandarin, cherry, blackberry, guayaba)
Fruity (citrus, blueberry)	Spicy (piment, vanilla, ginger)	Sweet (panela, caramel,	Nutty (hazelnut, walnut)	Sweet (honey, chocolate,
Nutty (hazelnut)	Nutty (almond, hazelnut,		Fruity (blackberry, peach)	Nutty (almond, hazelnut)
	Fruity and floral (lemon, mora, plum)			

Fig. 3: Impact of the inoculation on the aromatic profile of the coffees

CONCLUSION/PERSPECTIVES

The addition of microbial starter cultures during coffee fermentation is a very promising tool to allow coffee producers to steer the cup quality and facilitate their access to specific demands from the specialty coffee market. This study aimed to analyse the performance and aromatic effect of such practices used in the field. The knowledge gained will allow us to better train coffee growers and recommend efficient protocols when using microorganisms.