Impact of pollen genetic origin on compatibility, agronomic/ physicochemical traits, and bioactives compounds of some Trinitario cocoa (*Theobroma cacao* L.) hybrids from Cameroon

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Introduction

Cocoa (*Theobroma cacao* L.), the raw material of chocolate, is a commodity produced in the developing countries of the tropics and consumed mostly in the middle- and high-income countries of the world's temperate zones. It is mainly composed of three groups: Criollo, Forastero and Trinitario. Criollo, Nacional and many Trinitario are known to be fine or flavor grade. Today, the aromatic notes show to be the most important quality character of chocolate.
Futher works showed the importance of hybridization on the cocoa agronomic/physicochemical quality improvement. Indeed, the bioactive compounds content and composition is an important marker to differenciate and qualify cocoa.

The aim of this work is to assess the impact of cocoa pollen genetic origin on compatibility, on agronomic/physicochemical traits and finallly on bioactive compounds of hand-pollinated hybrids.

Materials et Methods

Materials Samples of this study were composed of 7 hybrids obtained by hand-pollination and 1 commercial cocoa obtained from buyers

Methods
- ❖Hand pollination was used to produce specific hybrids;
- ❖Average weight of pods and bans in each hybrid was measured using an electronic balance;
- ❖F.I, pH and Cut-test scores were obtained according to Eyamo et *al.* (2016);
- ❖Bioactive compounds analysis was done using an UPLC-DAD-MS TOF apparatus

Results

Table I : Results of hand-pollination

Mother-clones	Father-clones	Trials	Successful trials (%)	Mature pods harvested (%)	Seasonal crop years
ICS40	SNK16	300	03	03	2017 and 2018
	SCA12	300	80	73	
	SNK13	300	18	17	
	UPA134	300	75	71	
	T79/467	300	64	54	
SNK16	ICS40	300	03	03	2017 and 2018
	UPA134	300	59	43	
	SCA12	300	67	64	
	T60/887	300	81	75	
	SNK13	300	00	00	
SCA12	ICS40	300	88	72	2017 and 2018
	SNK16	300	87	67	
	T79/467	300	88	71	
	SNK13	300	78	55	
	UPA134	300	84	62	

Table II : Results of agronomic/physicochemical parameters

	Pod criteria			Bean criteria		
	LP	PW	PCT	NBP	WFB	WDB
ICS40×SCA12	27.07±1.37 c	927.65±60.01 c	1.68±0.51 ab	38.90±1.20 a	4,88±1.20 ef	1,92±0.22 ef
ICS40×UPA134	25.33±0.42 b	881.84±58.20 bc	1.55±0.36 ab	38.60±3.56 a	4,28±0.36 cd	1,82±0.42 e
SNK16×T60/877	26.87±0.71 bc	773.53±78.67 b	1.88±0.44 c	45.42±2.32 bc	3,86±0.57 b	1,62±0.66 c
SNK16×SCA12	24.16±0.46 b	763.35±28.55 b	1.37±0.75 a	41.10±1.75 ab	3,72±0.78 ab	1,53±0.81 cd
SCA12×ICS40	24.66±0.64 b	659.74±53.73 ab	1.41±0.24 a	47.60±1.43 cd	2,65±0.39 a	0,83±0.35 a
SCA12×T79/467	22.11±0.34 a	630.51±43.25 a	1.33±0.44a	44.75±2.23 b	2.57±0.77 a	0.73±0.31 a

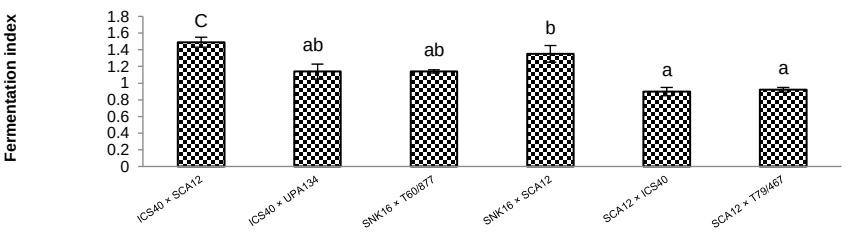

Fig. 1 : Results of Fermentation Index (F.I)

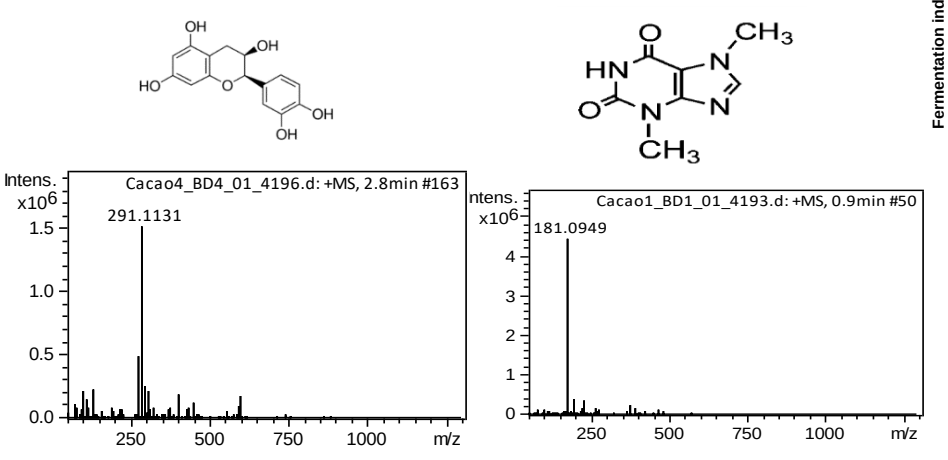

Fig. 2 : Bioactive compounds analysis results

Photo 1 : Some hybrids in differents steps of transformation

Conclusion and References

Conclusion Bioactive compound content and composition is mainly attributed to the genotype. The mother-clone, the variety and postharvest treatments play a key. Genotypes richer in bioactive can be sold expensive increasing income for cocoa farmers

References Bekele, F. and Phillips-Mora, W., 2019. Advances in plant Breeding : Industrial and Food Crops, Vol 6 http://doi.org/10.1007/9789-030-23265-8_12

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