RTB Working Paper

Assessment of Cassava Retting Ability of produced in different regions of Cameroon: Foumbot and Mbalmayo

Identification of contrasted varieties

Wakem G., Tizé I., Tonfack B.L., Youmbi E., Ndjouenkeu R., Dufour D., Fliedel G., Tran T. and Mbéguié-A-Mbéguié D.

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and bananas and to encourage debate and exchange of ideas. The views expressed in the papers are those of the author(s) and do not necessarily reflect the official position of RTB, CGIAR or the publishing institution.

Contents

Abstract

We examined here the effect of genotype and grown area on retting ability of different cassava varieties. To this end, 17 cassava varieties were harvest from two agro ecological regions from Cameroon and subjected to retting process in the field and in the laboratory. Using a texture analyzer, root softening was measure daily during retting in order to monitor the process. Our preliminary data indicated some interesting trends with a putative effect of growing area. They also led us to point out some putative contrasted verities displaying different ratting properties. These tendencies need however to be confirm by statistical data analysis before using the putative contrast varieties as model for comparative study of the physiological bases that govern retting and related biophysical indicators.

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Acknowledgments

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Assessment of retting properties of Cassava Varieties from different agropedoclimatic regions from Cameroon: Identification of contrasted varieties

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INTRODUCTION

Cassava retting process is a traditional fermentation that occurs spontaneously during root soaking leading to a roots softening. It is the critical step in the preparation of most traditional cassava-based food in central and West African countries (Ampe et al., 1994). Therefore retting ability of cassava root is considered as one of the most important traits determining the consumer preference.

As other quality traits, retting ability is complex and influenced by both genetic and environmental factors. However, the part of each them in the expression of retting as well as the root's physiological (biophysical and biochemical) bases that govern this trait of quality remain known. This lack of physiological indicators makes it difficult to take into account this quality trait into account earlier in breeding programs and marker assisted selection. Consequently, the quality traits of cassava hybrids varieties do not meet the end-user expectations and are little or not adopted.

In this study, we attempt to determine the biophysical indicators associated with cassava retting through comparative biophysical and physiological studies of contrasted cassava varieties with respect to this trait. We report here the partial results of the first step of this work, whose objective is to identify, in a varied environmental and genotype context, cassava varieties with contrasting retting ability.

MATERIAL AND METHODS

All experiments were carried out on a working collection of 17 varieties of cassava (Figure 1) grown under conventional practices in two agro ecological zones of Cameroon Foumbot and Mbalmayo. Agrpédoclimactic features of each of them (Kana 1993, https: //fr.climate-data .org / africa / cameroon / west / foumbot-894723 / viewed on 01/31/2019) are described in figure 2.

Retting experiment of mature roots was done both in the field by the processors and in the laboratory. The assessment of the retting process in the field was evaluated by roots' palpation. The measurement of root firmness using a method described by Mbéguié-A-Mbéguié et al (2019) was used to monitor retting performed in the laboratory.

RESULTS AND DISCUSSION

Evolution during retting of cassava root softening harvested at Foumbot and Mbalmayo is described in figure 3. Preliminary data analysis indicated that Cassava verities displayed a different softening rate according to their harvest area. But all verities soften completely after 50 hours. A marked softening contrast was observed at 24h after retting initiation.

. The varieties grown at Foumbot globally showed a higher firmness level compared to that produced at Mbalmayo suggesting a production zone effect in the development of retting. At this time, a contrast in terms of softening also emerges between varieties. Some varieties kept a high level of firmness (I090616 and local to Foumbot and 01-1797 and the local to Mbalmayo) while others (01-1797 to Foumbot and 01-0040-27) are strongly softened.

CONCLUSION

Preliminary data processing has shown some interesting trends. However, they need to be confirmed by extensive statistical analysis in order to (i) quantify the genotype and production area effect on retting ability and (ii) confirm the contrasting retting ability between identified varieties before using them as model for studying the physiological bases that govern retting and related biophysical indicators.

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FIGURES

A

Name	Rep. 1	Rep. 2	Rep. 3
I090521	33	32	28
I090574	41	40	34
I090616	35	32	35
92/0326	37	22	27
LMR	35	23	27
I090590	29	25	23
I090537	33	14	27

B

Name	Rep. 1	Rep. 2	Rep. 3
01/0040-27	33	38	39
I011412	33	21	14
01/1797	34	30	9
I083392	33	30	18
I070557	36	25	28
I071026	35	15	32
I070593	35	25	28
I083774	25	16	30
I082461	30	25	31
I082264	14	16	32
I070738	32	30	25

C

Name	Rep. 1	Rep. 2	Rep. 4
LMR	35	23	27
Zai aboma ze	Provided by the precessor		

Figure 1 : Collection of different cassava varieties used in this strudy
Cassava varieties used in this study are IITA's hybrids, are composed of white-fleshed varieties (A), bio-fortified and Yellow-Fleshed varieties (B), and white-fleshed varieties (A) including the LMR included as control in the trial. Zai ebome ze in the local variety produced and provided by the processor who participate in the study

B

Climatic parameters	Foumbot	Mbalmayo
Region	Western highlands	Southern humid forest
Agro ecological zone	III	IV
Mean Temperature	21°C	24°C
Relative humidity	80 %	>90 %
Soil	Volcanic	ferrallitic
Altitude	1064m	641m
Rainfall mean and model	1983 mm bimodal model	1709 mm bimodal model

Figure 2: Geographical localization (A) and agropedoclimatic parameters (B) of agro ecological regions target in this study.

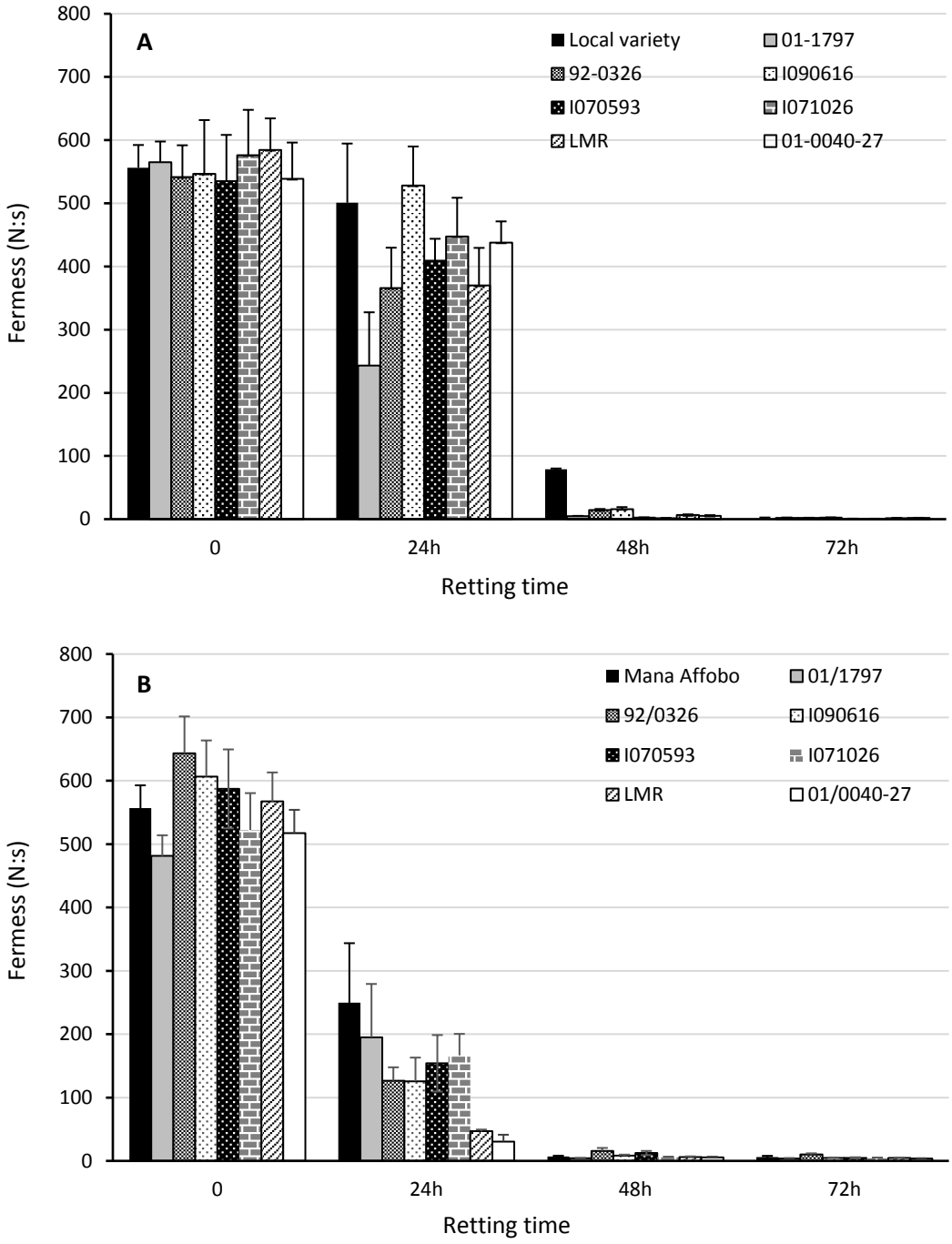

Figure 3: Root softening measurement during retting process of different cassava varieties from Foumbot (A) and Mbalmayo (B)

Cassava roots harvested at maturity and stored at 4°C were peeled, rinsed with water and kept retting at room temperature. Root softening was measured using a TA-XT2 textural analyzer as described in material and method section. The area under the texture evolution curve (AUTEC) was calculate to express root softening in Newton per second ($N.s^{-1}$).

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