



HAL
open science

Biochemical composition and mineral profile of dairy curd obtained by a plant extract of *Calotropis procera* in comparison with chymosin

Rayanatou Issa Ado, Mahamadou Elhadji Gounga, Gilles Garric, Marielle Harel-Oger, Arlette Leduc, Chantal Cauty, Jean-François Grongnet, Frederic Gaucheron

► To cite this version:

Rayanatou Issa Ado, Mahamadou Elhadji Gounga, Gilles Garric, Marielle Harel-Oger, Arlette Leduc, et al.. Biochemical composition and mineral profile of dairy curd obtained by a plant extract of *Calotropis procera* in comparison with chymosin. 3. International Symposium on Minerals & Dairy Products, Sep 2017, Wuxi, China. , 2017. hal-01610649

HAL Id: hal-01610649

<https://hal.science/hal-01610649>

Submitted on 4 Oct 2017

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Rayanatou Issa Ado ^{a,b,c}, Mahamadou ElHadji Gounga ^c, Gilles Garric ^{a,b}, Marielle Harel-Oger ^{a,b}, Arlette Leduc ^{a,b}, Chantal Cauty ^{a,b}, Jean François Grongnet ^a, Frédéric Gaucheron ^{a,b}

^aUMR 1253 Science et Technologie du Lait et de l'Œuf, Inra-Agrocampus Rennes, 65 rue de St-Brieuc, 35042 Rennes Cedex, France

^bAgrocampus Ouest, 65 rue de St-Brieuc, 35042, Rennes Cedex, France

^cFaculté d'Agronomie et des Sciences de l'Environnement, Université Dandicko Dankoulodo de Maradi, BP 465 ADS Maradi, Niger
 rayan2000atou@yahoo.fr ; frederic.gaucheron@inra.fr

Introduction

Cheese is used to preserve the essential constituents of milk (protein, fat, vitamin and minerals).^[1]

In West Africa, a traditional cheese named "wagashi" is manufactured using an extract of *Calotropis procera* leaves, a small latex tree

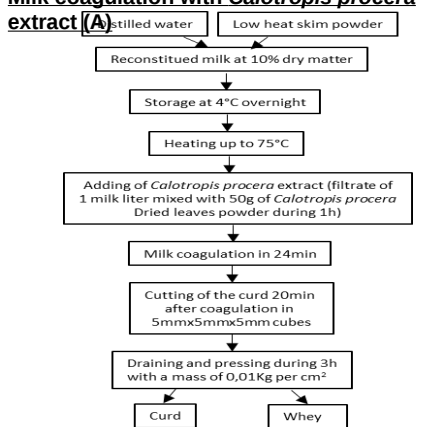


Objectives

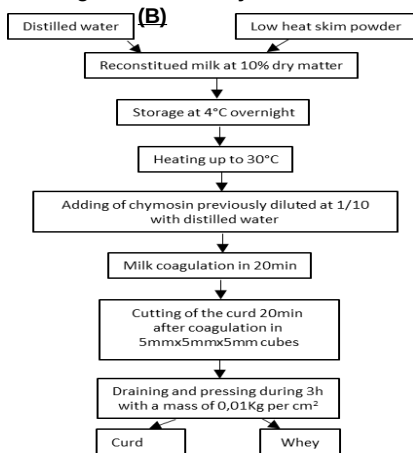
The aim of this work was to investigate the biochemical composition and mineral profile of curds manufactured using an extract of dried leaves of *Calotropis procera* as coagulant. The results obtained have been compared to those of control curds coagulated using

Materials and methods

Milk coagulation with *Calotropis procera* extract (A)



Milk coagulation with chymosin (B)



Results and discussion

Table 1: Biochemical composition of processed milks, *Calotropis procera* (A) and rennet (B) curds

	A (<i>Calotropis procera</i>)					
	pH (at 20°C)	Dry matter (g.Kg ⁻¹)	Ash (g.Kg ⁻¹)	Total nitrogen (g.Kg ⁻¹)	NCN (g.Kg ⁻¹)	NPN (g.Kg ⁻¹)
Milk	6.76±0.02	100.60±2.62	8.10±0.10	32.07±1.28	16.76±0.59	2.39±0.09
Curd	6.52±0.06	310.91±16.14	31.10±0.30	231.91±2.59	9.82±1.19	3.10±0.49
	B (Chymosin)					
Milk	6.73±0.04	100.97±0.20	8.15±0.20	33.50±0.89	17.32±1.02	2.16±0.06
Curd	6.69±0.04	305.75±9.31	25.52±1.25	207.84±16.81	7.84±1.70	1.83±0.28

The processed milks have similar composition. The contents in dry matter, ash and protein were more important in curd A than curd B.

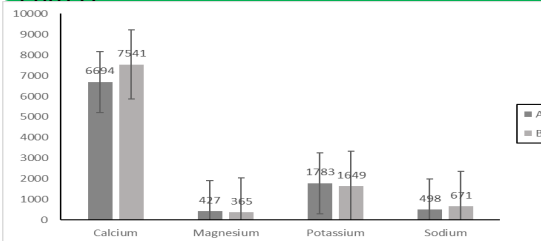


Figure 2: Mineral contents of *Calotropis procera* (A) and rennet (B) curds

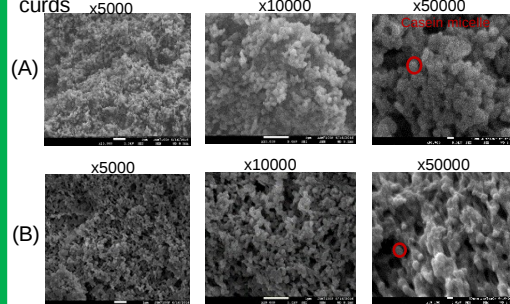


Figure 3: Microstructure of *Calotropis procera* (A) and rennet (B) curds observed on scanning electron microscopy

The two curds exhibited the same contents in minerals.

The protein network appeared well organized in the curd B compared to A.

Casein micelles were observed at high magnification in both curds.

Conclusion

The curds manufactured with *Calotropis procera* extract exhibited a good content in protein and minerals. This conclusion leads to encourage traditional dairy products consumption for a good protein and mineral supplementation in populations whose diet is poor in these elements.

Fox P. F. & McSweeney P. L. H., (2004), Cheese chemistry, physics and microbiology, Vol1, 1-18.

J. O. Ogunidin & O. L. Oke, (1983), Factors affecting the process of wara-a Nigerian white cheese, Food Chemistry, 11, 1-13.

Lawal A.K. & Adedeji O.M., (2013), Nutritional and elemental analysis of warankasi (fermented product) sold in Lagos metropolis, International Journal of Biotechnology, 4, 112-116.

Acknowledgments

The authors thanks the Programme de Productivité en Afrique de l'Ouest PPAO-Niger for the financial support.

