

Evaluation of the specificity of the hypoglycemic effect of the methanol extract of *Persea americana* on diabetic albino wistar rats and isolation of the antidiabetic principles of the plant



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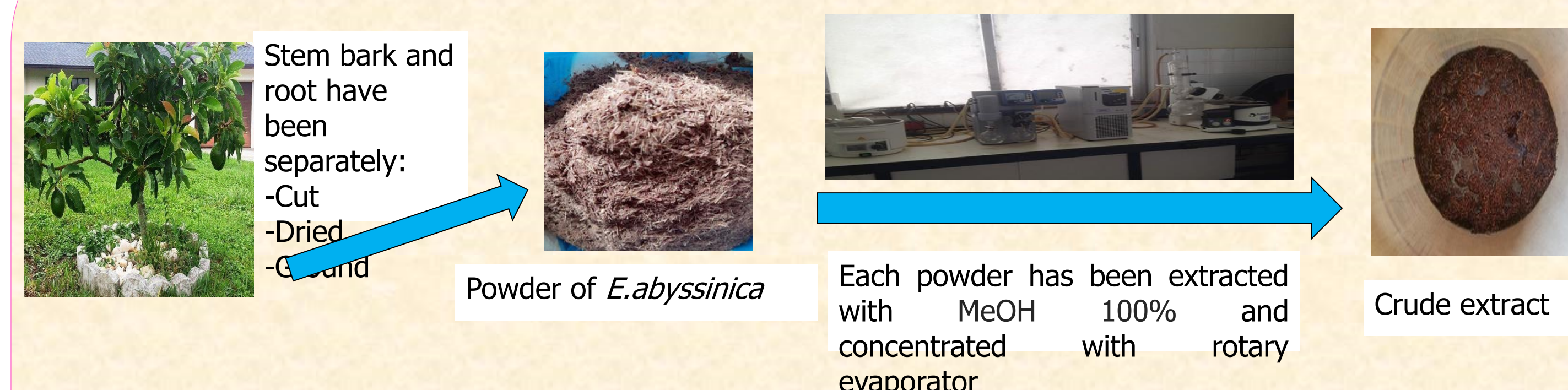
Phalone Zapzi¹, Guy Sedar Singor Njateng^{1,2*}, Guiguang Cheng³, Ya-Ping Liu², Xiaodong Luo²

Email Address: njatguysedars@yahoo.fr

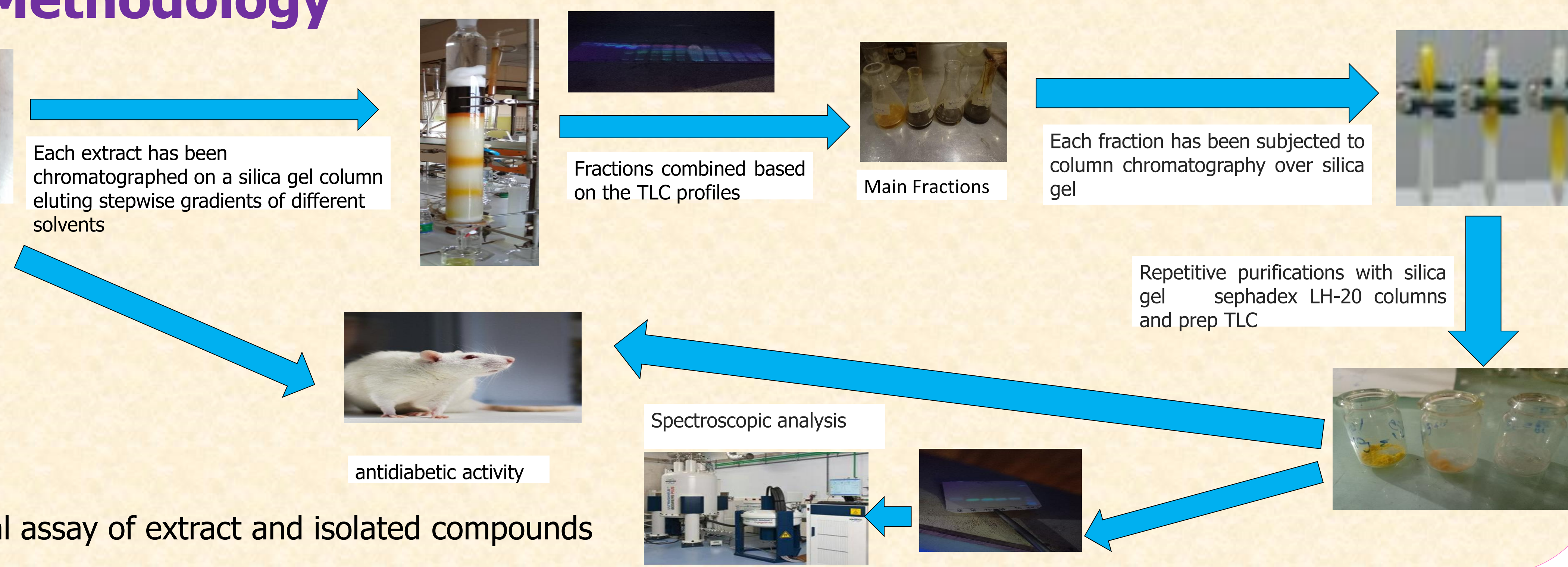
¹ Laboratory of Microbiology and Antimicrobial Substances, Faculty of Science, University of Dschang, P.O. Box 67 Dschang, Cameroon.

² State Key Laboratory of Phytochemistry and Plant Resources in West China, Kunming Institute of Botany, Chinese Academy of Sciences, Kunming, 650204, People's

Extraction and purification



Methodology



Scheme 1 : Steps for the isolation, characterization and biological assay of extract and isolated compounds

Introduction

Endemic diseases such as diabetes are proving to be an important public health problem, which Third World countries in general and African countries in particular have to face with limited economic means [1]. The consequences of these are the inaccessibility of populations to medicines whose quality, safety, efficacy and profitability are more or less guaranteed [2]. Hence the need to find a new source of antidiabetic drugs. The aim of this study was to contribute to the understanding of the mode of action of the methanolic extract of the leaves of *Persea americana* on the beta cells as well as to the isolation of the antidiabetic principles of the plant.

Results and discussion

Phytochemical investigation of *P. Americana* led to the isolation of two compounds identified as: **1,2,4-Trihydroxyheptadec-16-ene** (1) [3], **daucosterol** (2) [4].

The structure of these compounds were determined by 1D and 2D NMR spectroscopy and spectrometry analysis.

Specific antidiabetic action of the extract

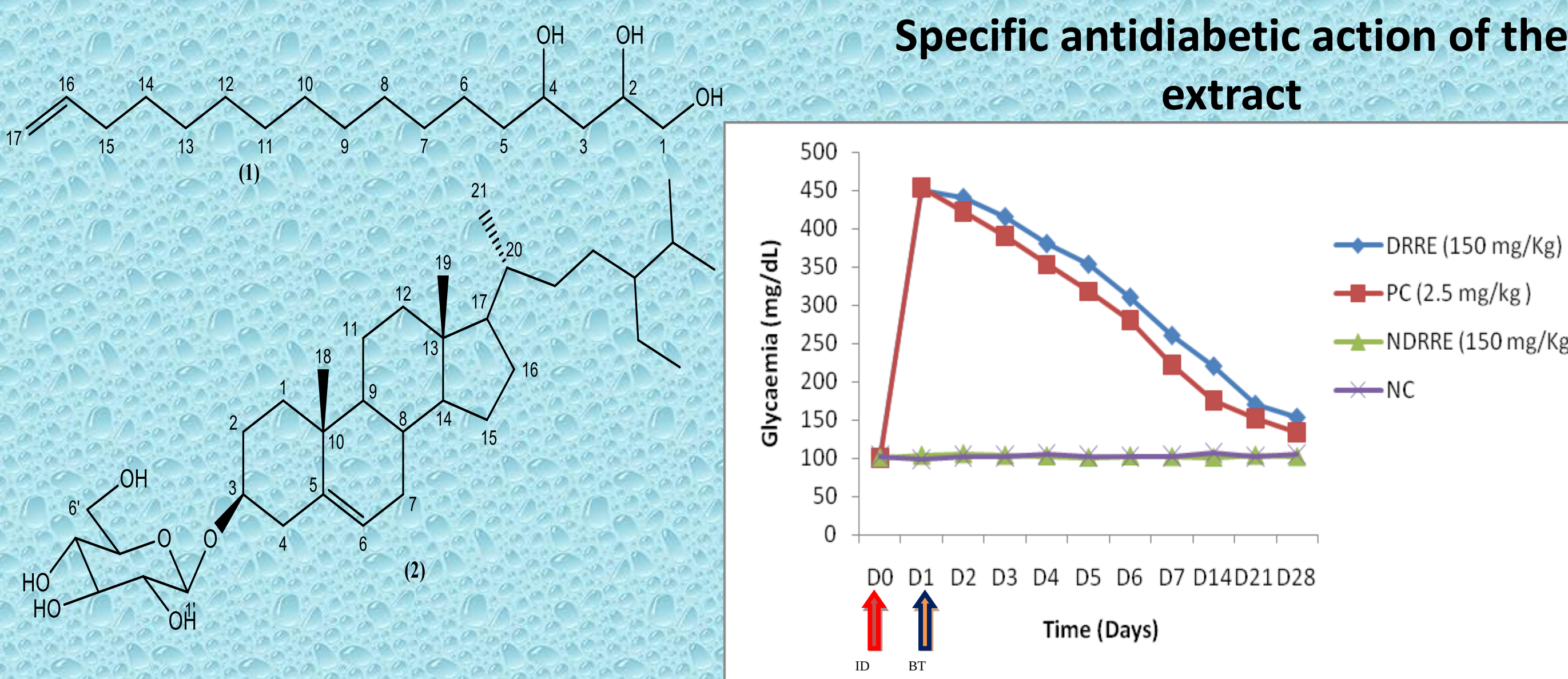


Figure 7 : Variation of blood glucose level in rats over time
Legend: PC = Positive control, DRRE = Diabetic rats receiving extract, NDRRE = Diabetic rats receiving extract, NC = Neutral control, ID= Induction of Diabetes, BT= Beginning of treatment

Tableau 1: Relative weight of the pancreas

Groups	Neutral control	Negative Control	Positive control	DRRE	NDRRE
Relative pancreas weight (mg/g)	0,89±0,10 ^c	0,43±0,01 ^a	0,55±0,00 ^{3ab}	0,68±0,05 ^b	0,90±0,17 ^c

Antidiabetic activity of isolated compounds

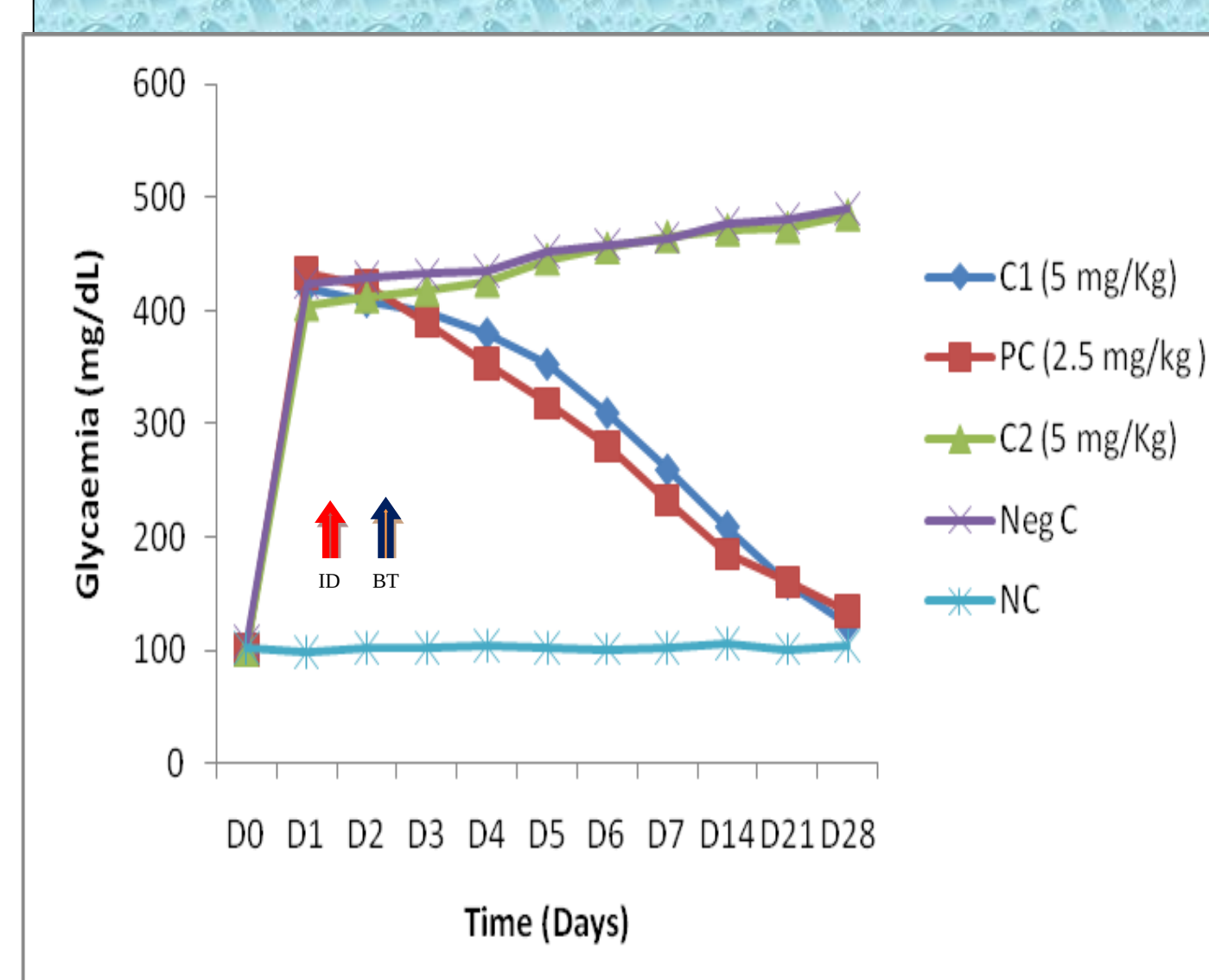


Figure 8 : Variation of blood glucose level in rats during treatment with isolated compounds
Legend: PC = Positive control, C1 = Diabetic rats receiving compound 1, C2 = Diabetic rats receiving compound 2, NC = Neutral control, Neg C = Negative control, ID= Induction of Diabetes, BT= Beginning of treatment

Table 2: Effect of the Isolated compounds on the relative weight of the pancreas

Groups	Neutral control	Negative control	Positive control	Compound 1	Compound 2
Relative pancreas weight (mg/g)	0.86±0.07 ^c	0.43±0.01 ^{5a}	0.50±0.00 ^{3a}	0.74±0.05 ^b	0.47±0.01 ^{7a}

Histological sections of the pancreas

□ The histology of the rat treated with the extract of *P. americana* shows an improvement in the state of the islets of Langerhans compared to that of the negative control.

□ There is a disappearance of beta cell necrosis resulting in the presence of well-defined islets and similar to that of the neutral control

Conclusion

The extract has a long-lasting antidiabetic effect by regenerating beta cells and contains antidiabetic active ingredients, one of which is 1,2,4-Trihydroxyheptadec-16-ene.

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- We acknowledge the supports of TWAS-ICCBS without what this work could not be presented here.

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