

α -Amylase and α -glucosidase inhibitors from *Zanthoxylum chalybeum* root bark

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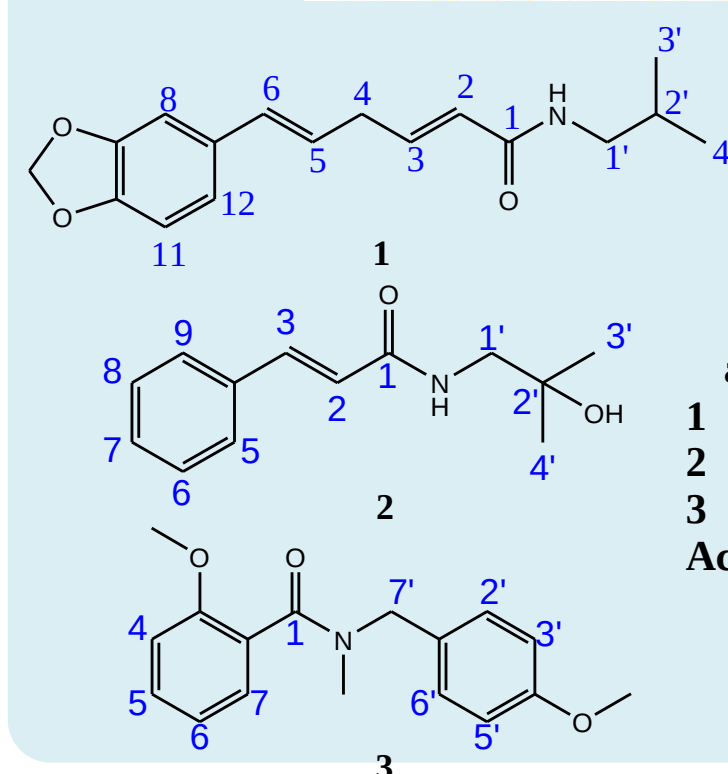


2nd Commonwealth Chemistry poster

Graphical Abstract



Zanthoxylum chalybeum Engl



In vitro IC₅₀ inhibition of:

	amylase (μM)	glucosidase (μM)
1	45.8	43.5
2	43.2	44.3
3	46.7	47.4
Acarbose	42.7	44.8

Introduction

Zanthoxylum chalybeum Engl. (family Rutaceae), used ethno-medicinal against diabetic complications [1]. The root and stem bark decoctions of *Z. chalybeum* reported to possess significant antihyperglycemic activities [1, 2]. Metabolites of this plant were established previously; however, the potential active anti-hyperglycemic compounds had never been established. A systematic analysis of the root bark of *Z. chalybeum* was conducted on alkaloid and the alkaloid free fraction to establish the antidiabetic potential of isolated compounds.

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Methodology

Z.C crushed root bark 0.8kg
soaked 95% Aq. MeOH
30 g crude extract

Aq. H₂SO₄/EtOAc
total alkaloid
extraction

0.7 g
alkaloid
extract

11 g alkaloid
free extract

1. α -Amylase
inhibition assay
2. α -Glucosidase
inhibition assay

Chromatography
RP-C18(CC)
PTLC
16 compounds

Spectroscopy

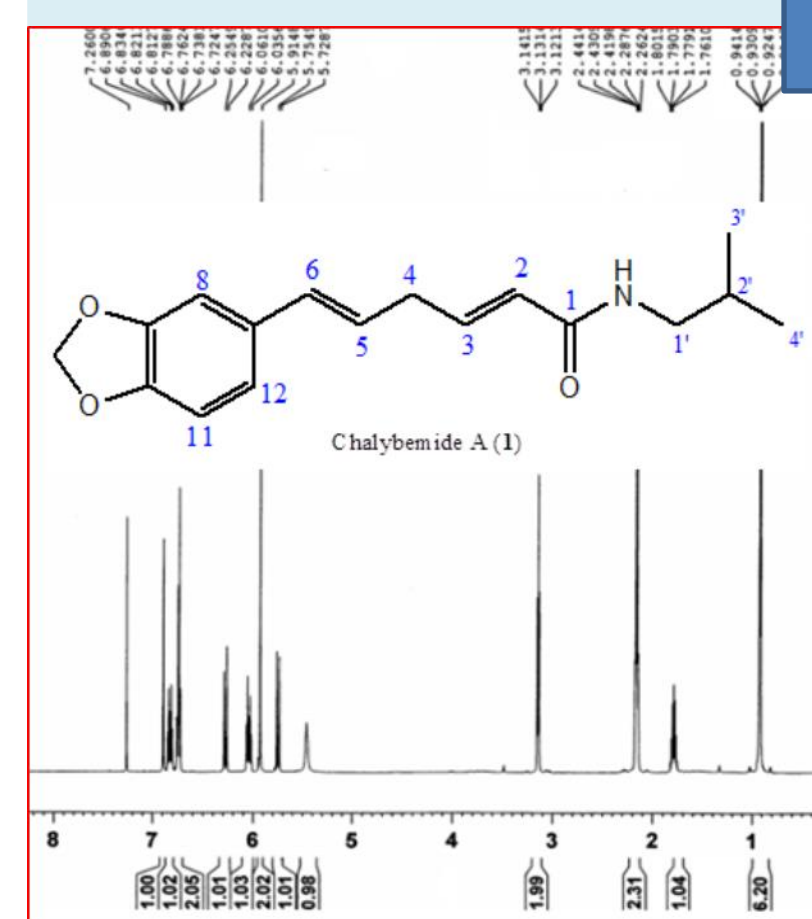


Figure 1: ¹H NMR 1

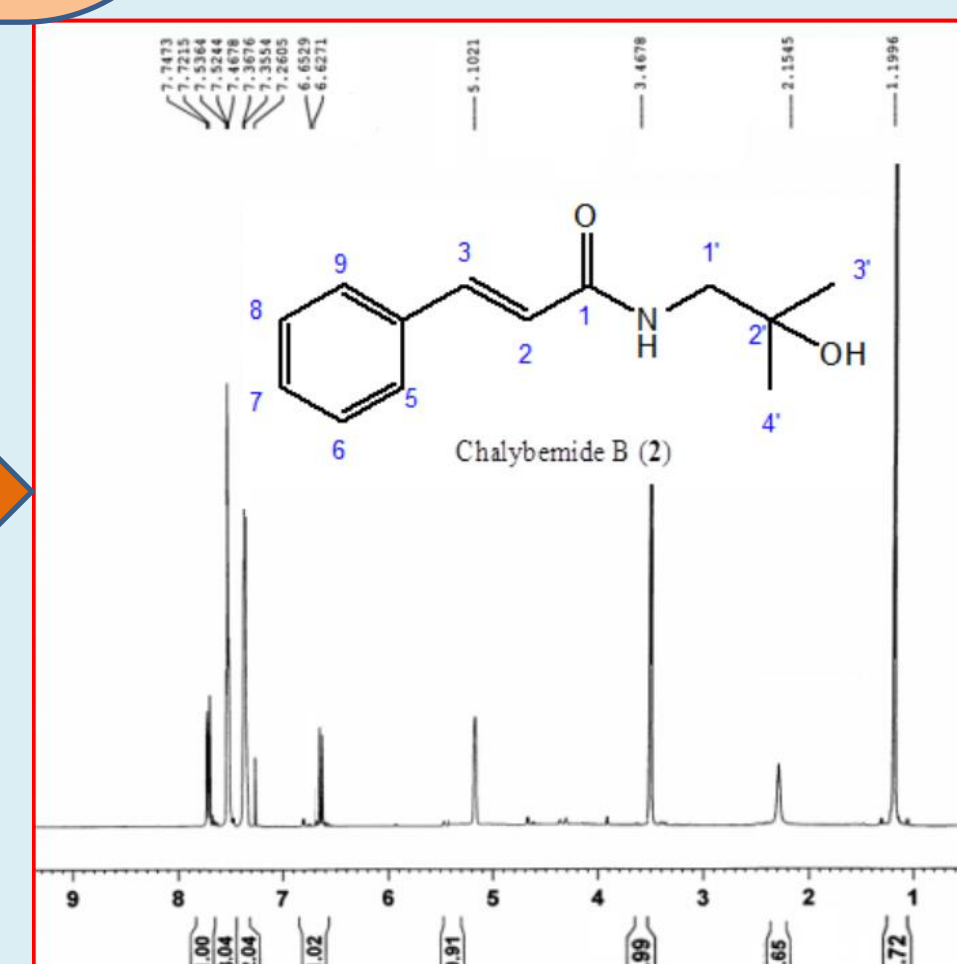


Figure 2: ¹H NMR 2

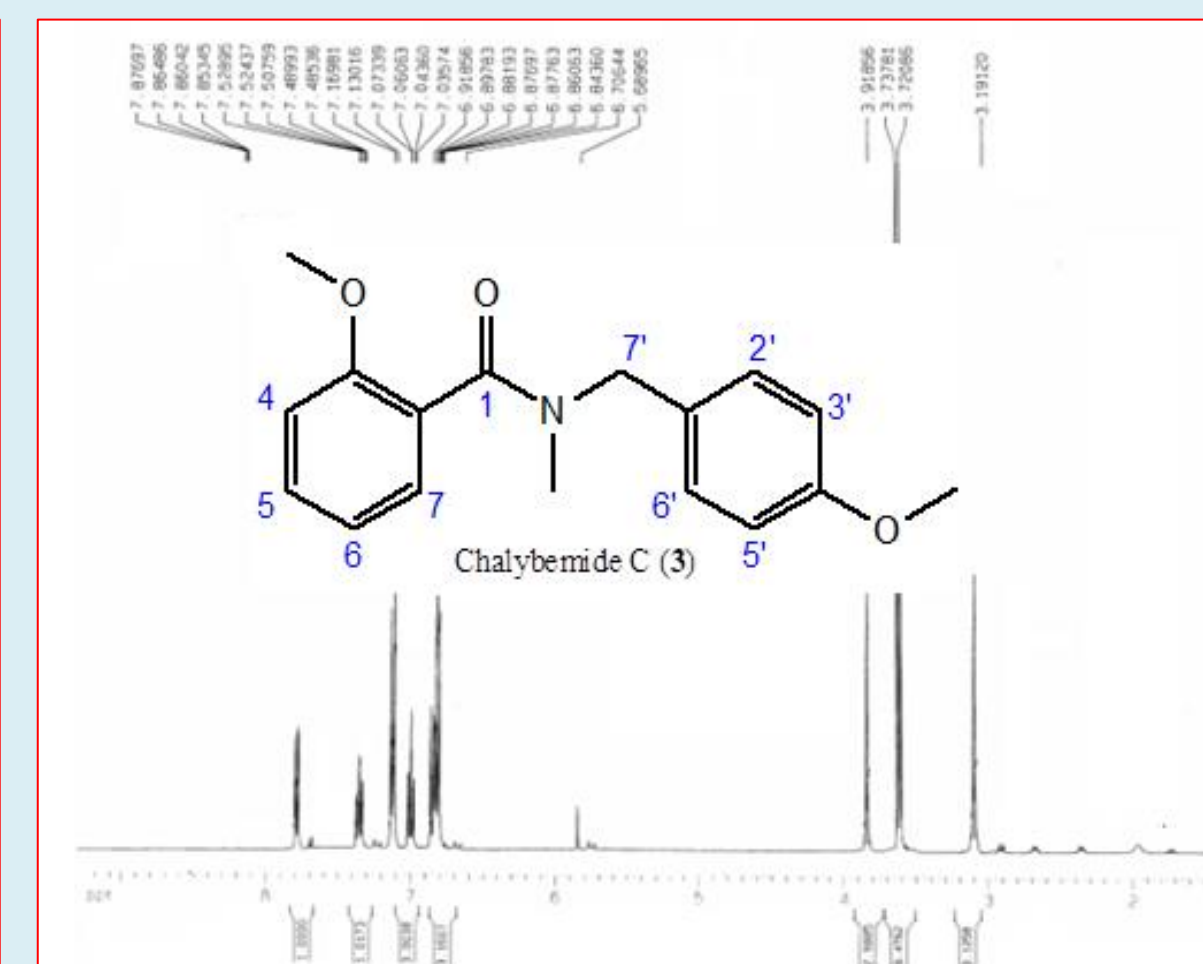


Figure 3: ¹H NMR 3

Results

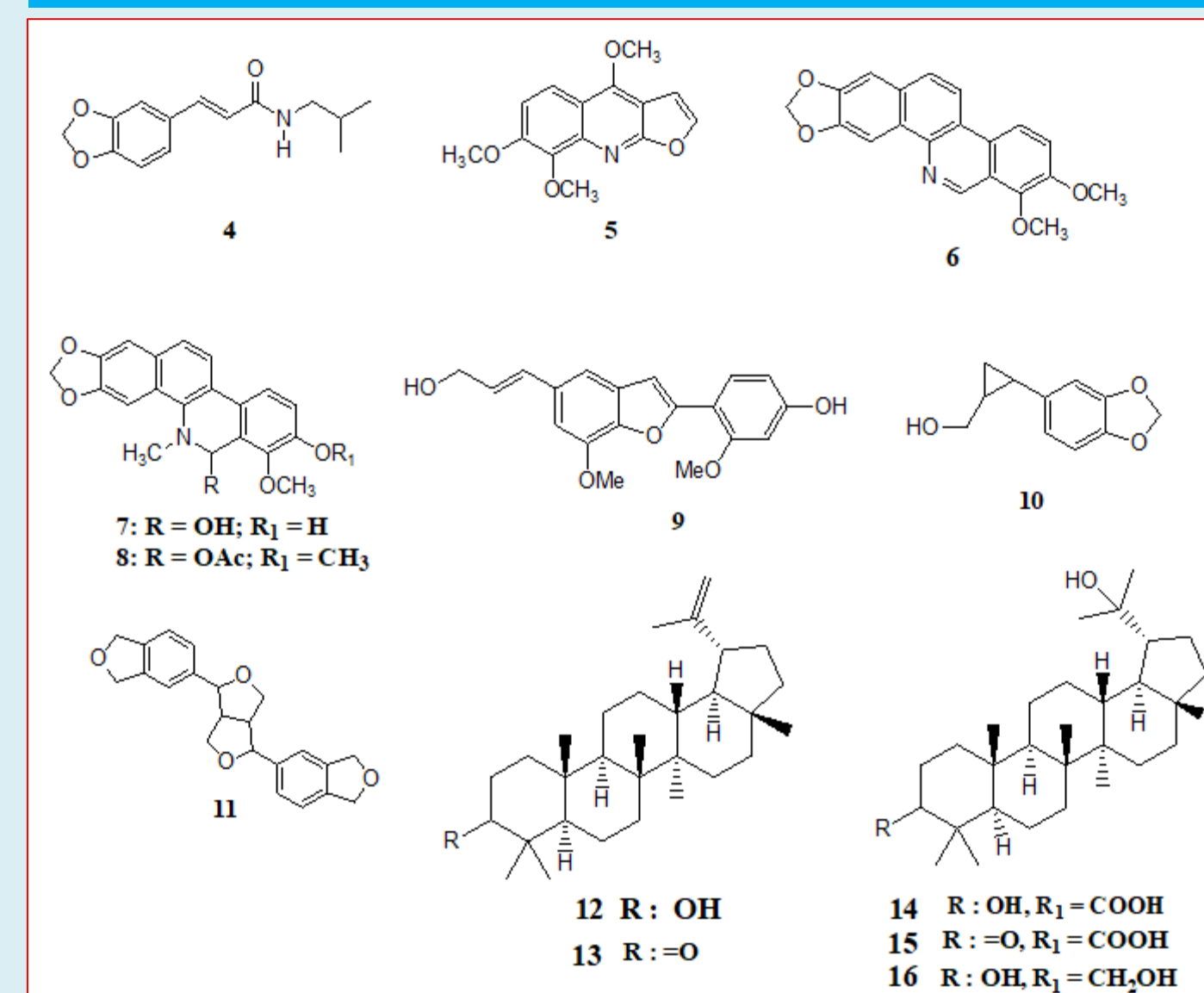


Figure 4: fagaramide (4); skimmianine (5), norchelerythrine (6), 6-acetylidihydrochelerythrine (7), 6-hydroxy-N-methyl decarine (8); ailanthoidol (9), 2,3-epoxy-6,7-methylenedioxy coniferyl alcohol (10), sesamine (11), lupeol (12), lupanone (13), 3 α ,20-dihydroxy-28-lupanoic acid (14), 20-hydroxy-3-oxo-28-lupanoic acid (15) and 3 α ,20,28-trihydroxylupane (16).

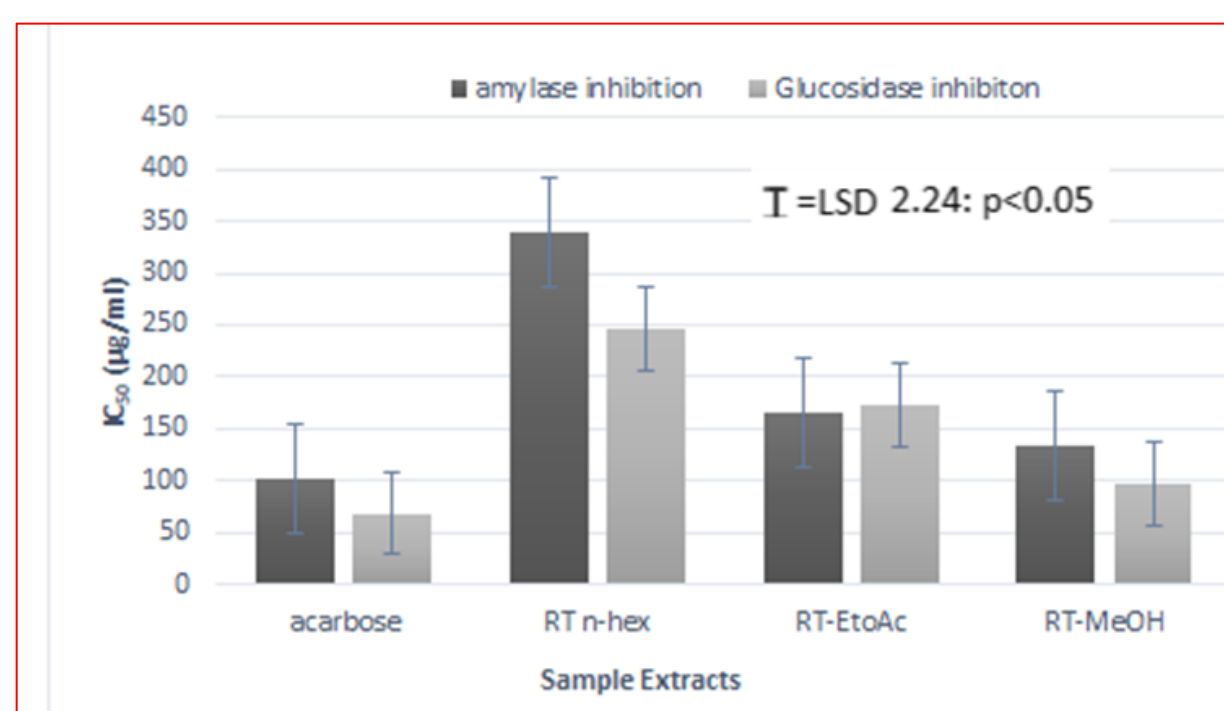


Figure 5: α -Amylase & α -glucosidase IC₅₀ of extracts (mean $\pm$ standard error)

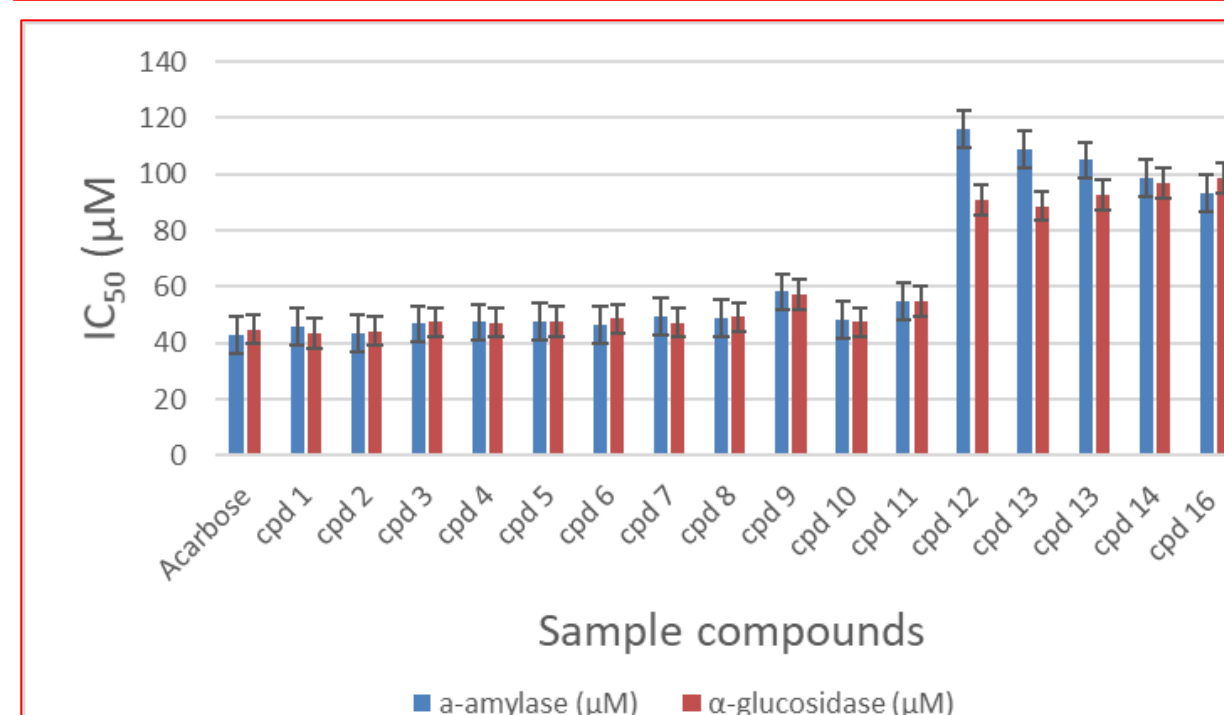


Figure 6: α -Amylase and α -Glucosidase IC₅₀ of compounds (mean $\pm$ standard error)

Conclusions

- Three new amide alkaloids 1-3 described for first time.
- 8 Compounds (1-8) displayed inhibitory activities against both α -amylase and α -glucosidase
- The results confirmed anti-hyperglycemic potential of compounds from *Z. chalybeum*.

Acknowledgement

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Reference

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- Kimani, C. N., Mbaria J. M., Suleiman, M., Gakuya, D., Kiama, S. G. (2015). *Journal of Phytopharmacology*, 4 (3), 183-189.