

Introduction

About 80% of the world population relies on traditional medicine for their therapeutic purposes[1].

Diabetes mellitus is a metabolic disorder resulting from a high level of glucose concentration (hyperglycemia) in the blood stream and alterations in the metabolism of various major macro molecules resulting from impairments in the secretion of insulin or its action[2]. Diabetes is considered the fifth leading cause of mortality in the world [3]. In diabetes, the hyperglycemia generates reactive oxygen species (ROS)/free radicals which leads to damages of the cell membrane and cause lipid peroxidation, which leads to several secondary complications such as retinopathy, nephropathy, neuropathy, and angiopathy [4].

Cassia rotundifolia (Leguminosae) is a subwoody herb, with prostrate branches up to 18 inches long radiating from the rootstock with a yellowish flowers. It is commonly known as round leaf cassia. It is locally called “Epa-ile” among the Yoruba ethnic group. There is little or no information provided on the in-vitro assessments of *C. rotundifolia* antioxidant and antidiabetic potentials.

Aim of the Study

- The current study evaluates the phytochemical constituents, *in-vitro* antioxidant and antidiabetic potentials of extracts from *Cassia rotundifolia* leaves

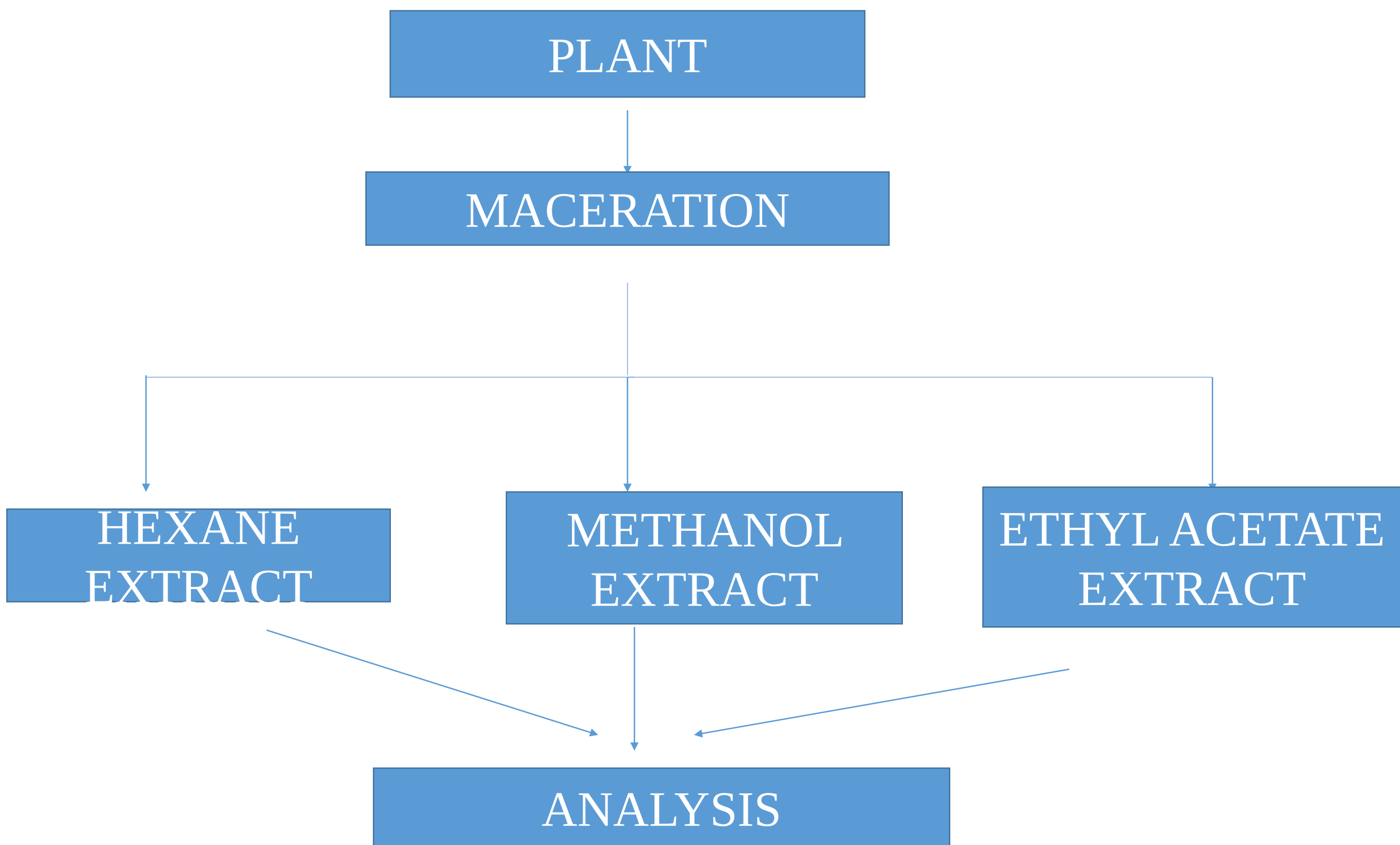


Phytochemical compositions and *In-vitro* assessments of antioxidant and antidiabetic potentials of fractions from *Cassia rotundifolia*

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Methodology



Results

TABLE 1: Phytochemicals of fractions from *Cassia rotundifolia*

PHYTOCHEMICALS	CRE	CRM	CRH
Flavonoid	+	+	-
Tannin	-	+	+
Steroid	-	+	-
Alkaloid	+	-	+
Phlobatannin	-	-	-
Saponin	+	+	+
Terpenoid	+	+	+
Cardiac glycoside	+	-	+
Phenol	-	+	+
Reducing sugar	-	+	+

Key: + = present, - =absent,
CRE: *C. rotundifolia* ethyl acetate extract ;
CRM: *C. rotundifolia* methanol extract;
CRH: *C. rotundifolia* hexane extract;

TABLE 2: IC₅₀ values of *C. rotundifolia* extracts against α-amylase and α-glucosidase.

EXTRACTS/CONTROL	α-Amylase	α-Glucosidase
Acarbose	10.82 ± 0.03	34.09 ± 0.02
Ethyl acetate	75.89 ± 0.04	74.10 ± 0.02
Methanol	67.80 ± 0.02	76.44 ± 0.05
Hexane	75.10 ± 0.01	60.81 ± 0.02

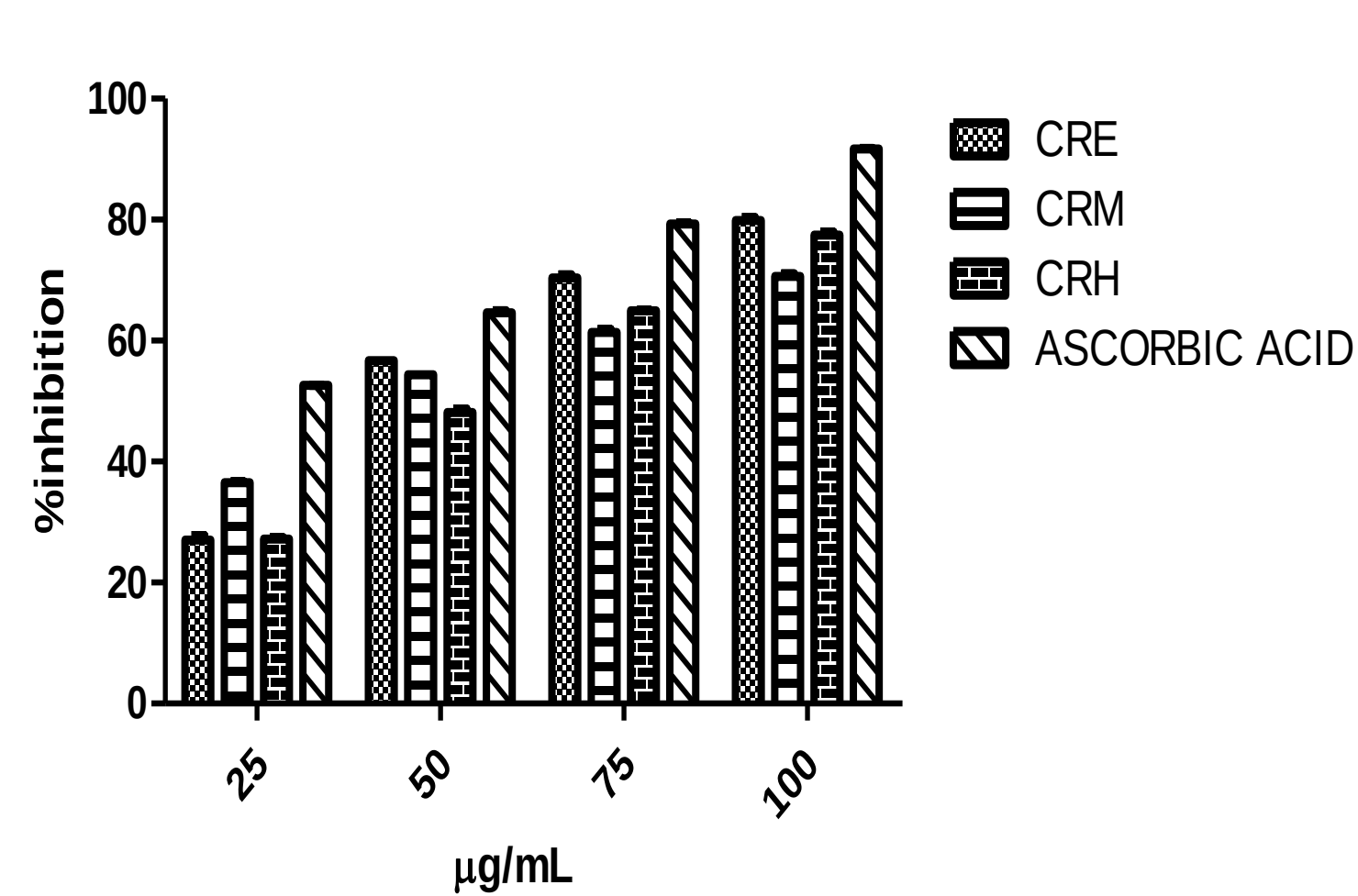


Fig. 1. DPPH radical scavenging effect of *C. rotundifolia* leaves fraction.

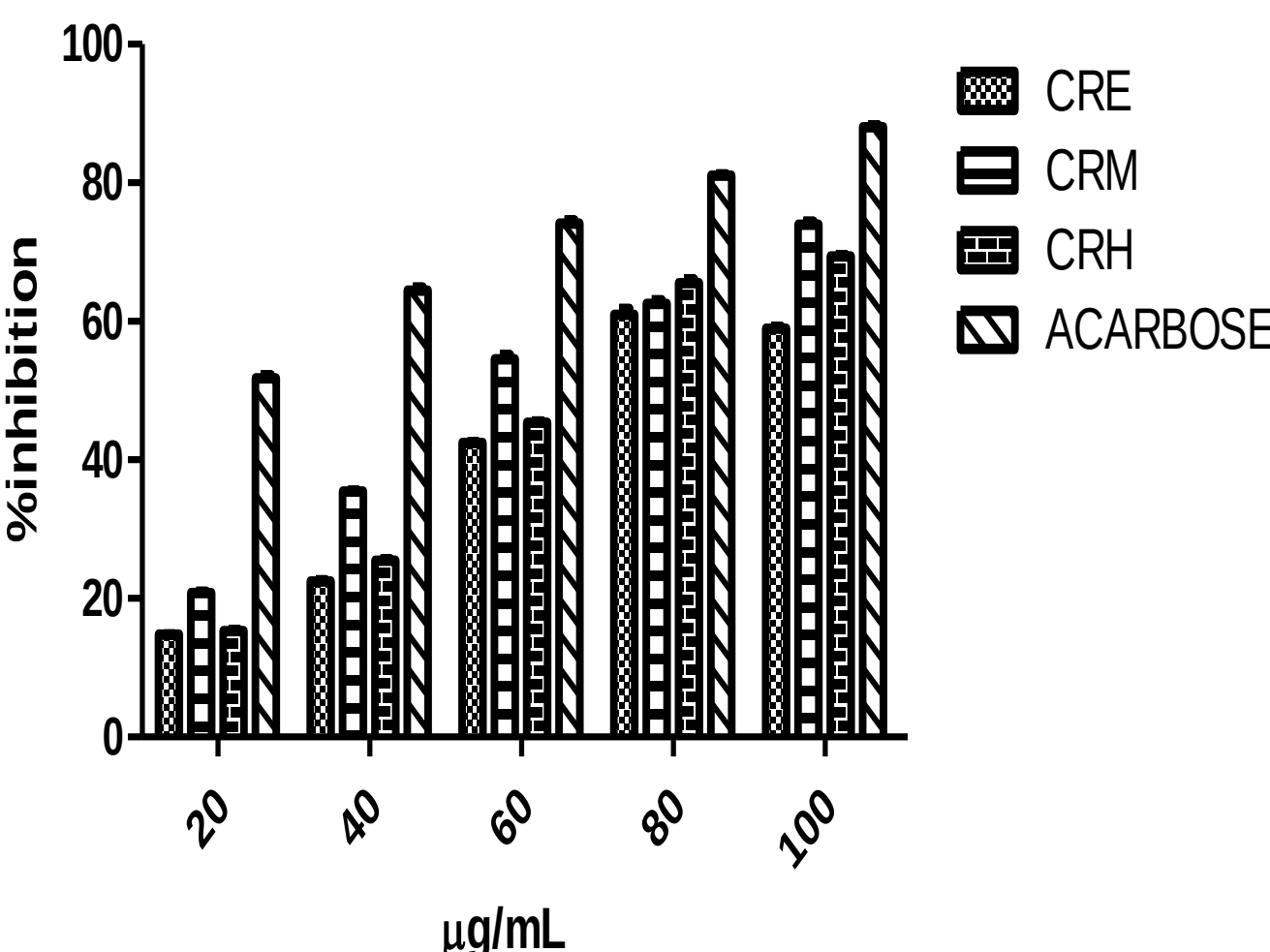


Fig 3: Inhibitory potency of *C. rotundifolia* leaves fractions against α-amylase activity.

EXTRACT/CONTROL	DPPH	Nitric oxide
ETHYL ACETATE	50.27 ± 0.01	50.28 ± 0.04
HEXANE	56.39 ± 0.01	56.08± 0.02
METHANOL	49.48 ± 0.03	54.94 ± 0.03
ASCORBIC ACID	20.74 ± 0.01	21.23 ± 0.03

Table 3: In vitro radical scavenging assay of *C. rotundifolia* extracts

DISCUSSION

- Higher flavonoid (39.06 quercetin/g) contents was displayed in methanol, while hexane revealed highest phenol (37.47 gallic/g) and ethyl acetate displayed higher alkaloid conetents (48.81mg/100g)
- The various antioxidant activities displayed by the methanol extract of *C. rotundifolia* may be due to the presence of high contents of flavonoids.
- Methanol extract demonstrated a mild potentiation inhibition activity against α-amylase (75.10 µg/ mL) and potent inhibition against α-glucosidase (60.81 µg/ mL). The antidiabetic activity displayed by the methanol fractions may be due to its higher flavonoid and presence of other phytochemicals present

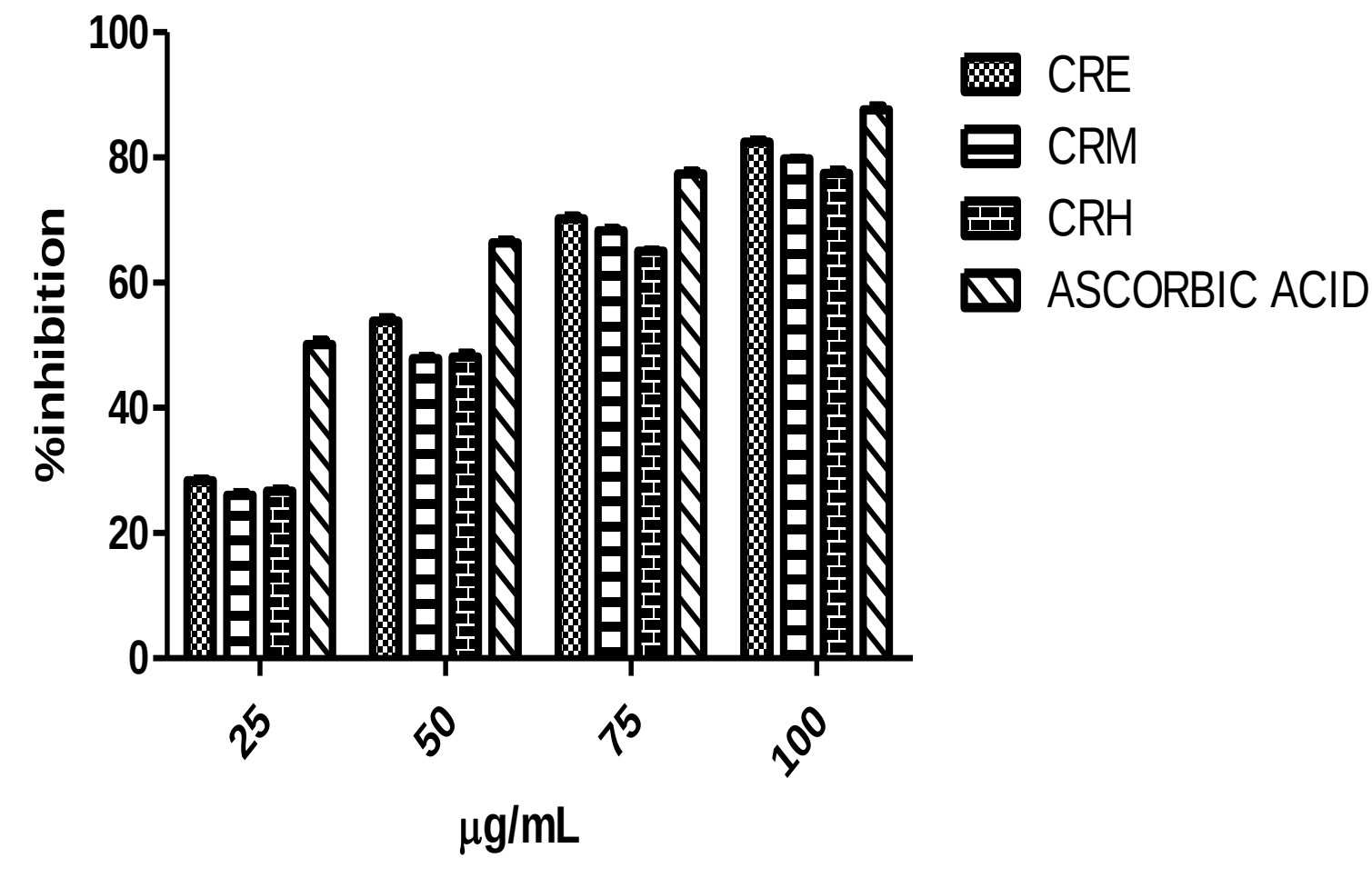


Fig. 2. Nitric oxide radical scavenging effect of *C. rotundifolia* leaves fraction

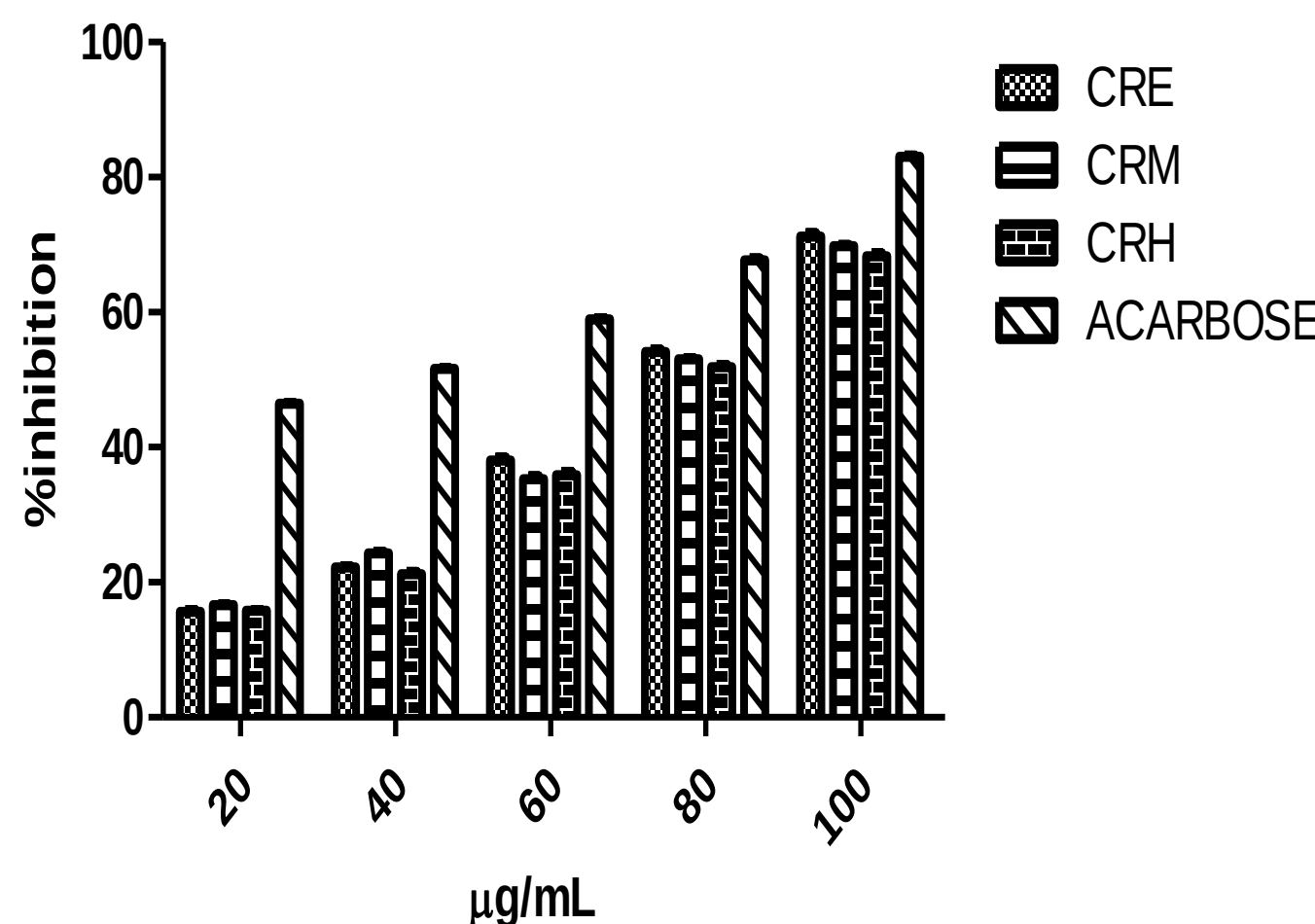


Fig 4: Inhibitory potency of *C. rotundifolia* leaves fractions against α-glucosidase activity

- 29 compounds were identified were identified from the gas chromatography - mass spectrometry (GC–MS) analysis of the methanol extract of *C. rotundifolia*. The major components The major constituents were 8 Octadecenoic acid methyl ester (23.59%), Methyl stearate (22.80%), Hexadecanoic acid, methyl ester (11.37%), Oleic acid (3.4%), 5-pentadecanone (3.04%) and catechol (0.75%).

Conclusion

The study concludes that the *C. rotundifolia* leaves contain active phytochemicals that could serve as antioxidative agents and inhibitors of α-glucosidase and α-amylase, indicating its therapeutic potential for the control of diabetics and other stress related oxidative stress.

References

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