Inhibitory effect of *Bauhinia rufa* on oxidative stress and enzymes related to metabolic syndrome

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Introduction

The metabolic syndrome is characterized by a set of metabolic risk factors that increase the chance of developing cardiovascular diseases and type 2 diabetes. The present study was to carried out to investigate the antioxidant potential and inhibitory of enzymes related to the metabolic syndrome of leaf methanolic extract of *Bauhinia rufa* (Bong.) Steud. (MEBr).

Materials



Bauhinia rufa (Bong.) Steud

Antioxidant activity was evaluated by DPPH and ABTS free radical scavenging assays, inhibition of β-carotene bleaching, FRAP, reducing power, evaluation of the antioxidant enzyme activity SOD, CAT and GPx, reduction of MDA in human erythrocytes.

Inhibition of formation of advanced glycation products (AGEs) via fructose and via glyoxal. Enzymes related to metabolism investigated were α-amylase, α-glycosidase and lipase.

Results

The MEBr presented antioxidant activity in the free radical capture assays DPPH, ABTS, inhibition of β- carotene bleaching, FRAP and reducing power (Table 1); stimulated the activity of SOD in the concentrations of 50 to 250 µg/ml and did not alter the activity of CAT and GPx (Figure 1); reduced the oxidative stress observed by the lower MDA content generated (Figure 2); presented anti-glycation activity by reducing fructose-generated AGEs and via glyoxal; and inhibited α-amylase, α-glycosidase and lipase activity (Table 2).

Table 1. Antioxidant properties of the methanolic extract of leaves from *Bauhinia rufa* (Bong.) Steud (MEBr).

	DPPH	ABTS	β-carotene bleaching	FRAP	Reducing power
	IC_{50} (µg/ml)			EC_{50} (µg/ml)	
Hydrophilic antioxidant	3.06 ± 0.09	2.30 ± 0.08	-	33.58 ± 0.80	42.97 ± 0.70
Lipophilic antioxidant	21.49 ± 0.39	22.77 ± 2.18	3.80 ± 0.10	-	-
MEBr	8.23 ± 0.46	5.24 ± 0.37	196.99 ± 20.51	125.88 ± 4.81	231.11 ± 2.87

Hydrophilic antioxidant- ascorbic acid; Lipophilic antioxidant – BHT or BHA. The results are expressed in mean ± SEM.

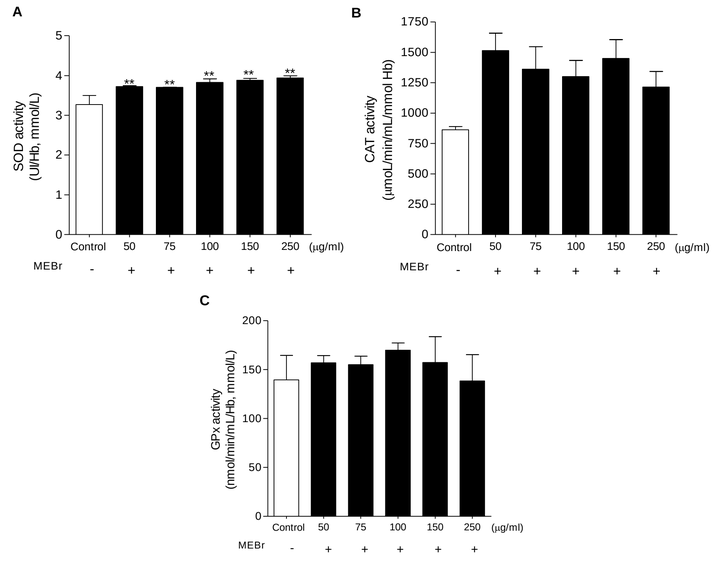


Figure 1. Antioxidant properties of the methanolic extract of leaves from *Bauhinia rufa* (Bong.) Steud (MEBr) on the activity of antioxidant enzymes: superoxide dismutase (A), catalase (B) and glutathione peroxidase (C) in erythrocyte lysates incubated with different concentrations of MEBr (µg/ml). Values are expressed as mean ± SEM. **P <0.01 compared to control.

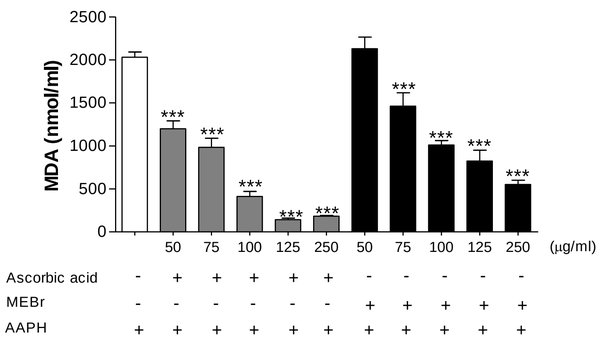


Figure 2. Antioxidant properties of methanolic extract of leaves from *Bauhinia rufa* (Bong.) Steud. (MEBr) in human erythrocytes incubated for 180 min in the presence of 50 mM AAPH. Malodialdehyde content (MDA). Values are expressed as mean ± SEM. ***P <0.001 compared AAPH.

Table 2. Anti-AGEs activity and α-amylase inhibition, α-glucosidase inhibition and lipase inhibition by the methanolic extract of leaves from *Bauhinia rufa* (Bong.) Steud (MEBr).

	Glycation		α-Amylase	α-Glucosidase	Lipase
	Fructose	Glioxal	IC_{50} (mg/ml)	IC_{50} (µg/ml)	
	IC_{50} (µg/ml)				
Quercetin	0.32 ± 0.01	35.59 ± 0.48	-	-	-
Acarbose	-	-	3.39 ± 0.11	-	-
Orlistat	-	-	-	-	1.32 ± 0.01
MEBr	2.76 ± 0.09	53. 13 ± 0.43	6.80 ± 0.09	16.54 ± 0.86	65.98 ± 0.55

The results are expressed in mean ± SEM.

Conclusion

Taken together, these data reveal the therapeutic potential of MEBr for the prevention and treatment of metabolic disorders.

Biography
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