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Lyophilized garambullo juice concentrate has endothelium-independent vasodilator effects on isolated thoracic rings from rats with metabolic syndrome-associated hypertension

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INTRODUCTION & AIM

Metabolic syndrome (MS), which increases cardiovascular risk, is constituted by abdominal obesity, dyslipidemia, insulin resistance, and hypertension (HTN). Genetic and environmental factors, such as sedentary lifestyle and high-calorie diet, play an essential role and contribute to the increased mortality rate.

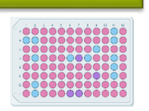
Garambullo, the fruit of *Myrtillocactus geometrizans*, contains betalains and flavonoids, but its effect on vascular function has not been elucidated.

This study evaluated the vasodilator effect of a freeze-dried garambullo juice concentrate (CJG_L) on the thoracic aortic rings of Wistar rats with MS and high-fat-diet-induced HTN.

METHOD

Liophylized Garambullo Juice Concentrate (CJG_L)

Total content (TC) and antioxidant capacity

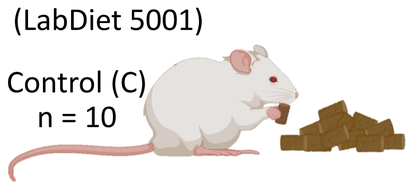


Betacianin (Bc) Flavonoids (F) FRAP
Betaxhantins (Bx) Polifenols (P) ORAC

MS model
Male Wistar rats

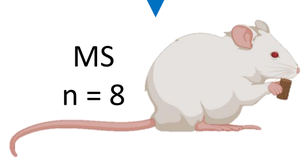
Standar Diet
(LabDiet 5001)

Control (C)
n = 10

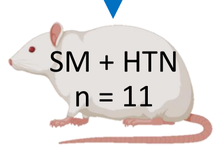


High fat diet
(41%)

MS
n = 8



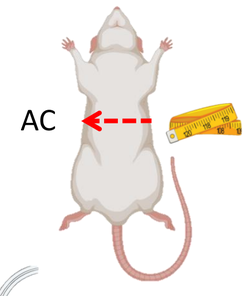
SM + HTN
n = 11



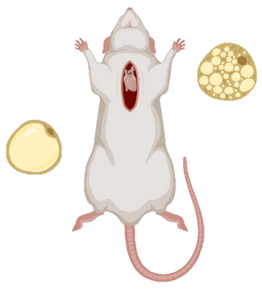
Somatic and biochemical parameters

Weight

Abdominal circumference

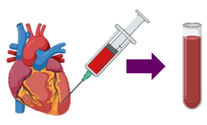


Adipose tissue



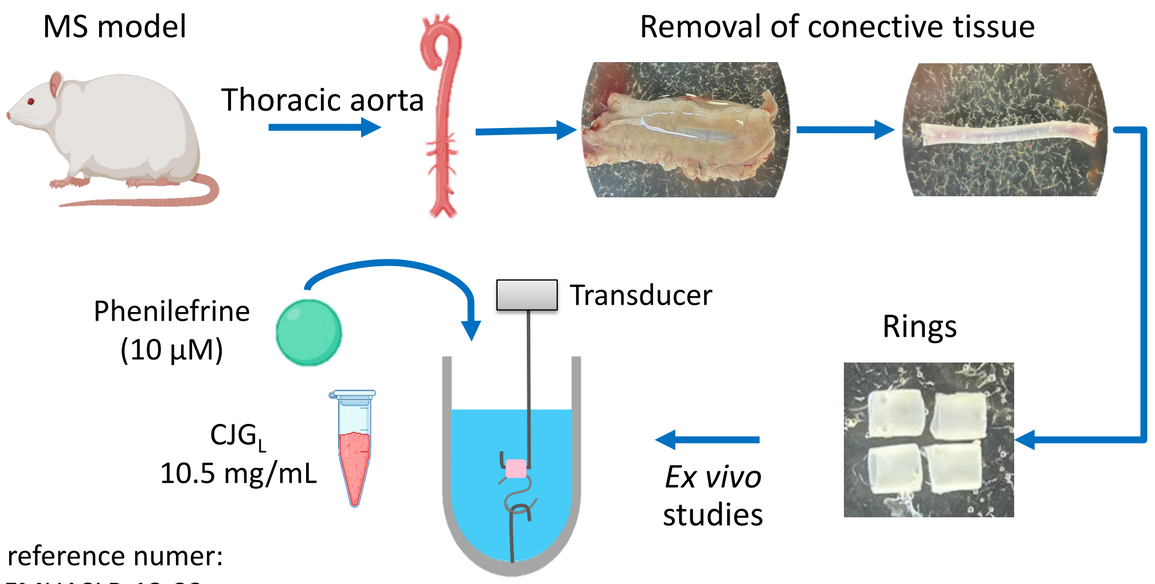
Glucose tolerance test

HDL-c



Blood pressure

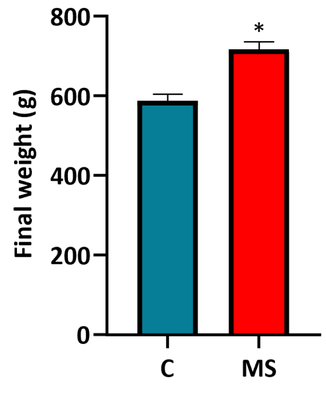
Isometric stress studies

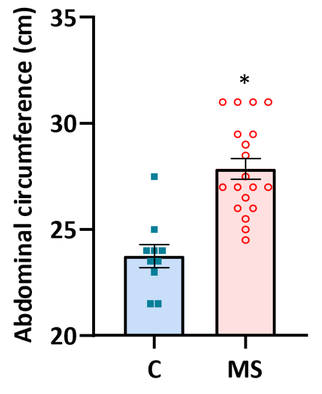


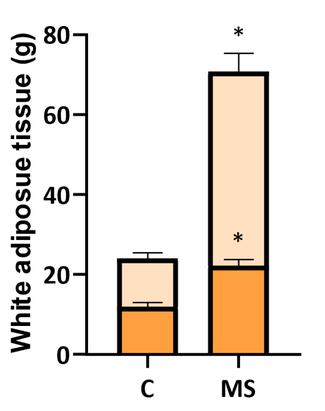
Trial reference numer:
BGFMUASLP-13-22

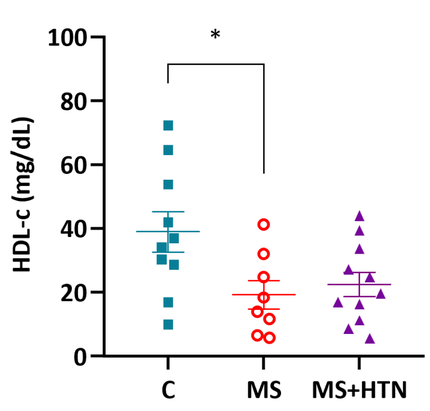
RESULTS & DISCUSSION

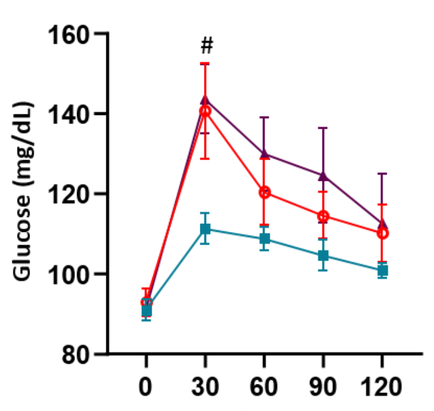
Content per 100 mL of Edible fraction						
Sample	TBcC (mg/L)	TBxC (mg/L)	TFC (mgCaE/L)	TPC (mgGAE/L)	FRAP (Trolox eq/g)	ORAC (Trolox eq/g)
CJG_L	54.8 ± 0.8	21 ± 0.5	61.5 ± 4.1	235 ± 25.2	17.7 ± 3.74	15.7 ± 2.1

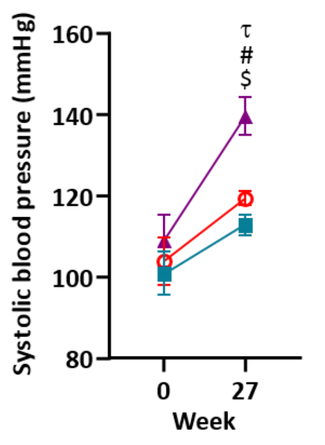


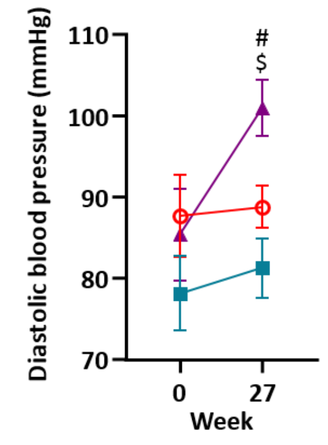


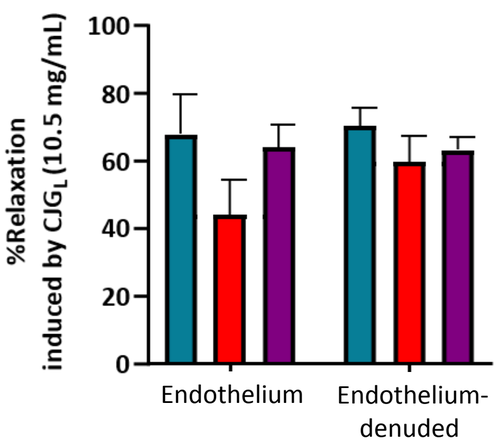












C MS MS+HTN

*$p<0.05$ vs GC; $^{\$}p<0.05$ vs SM+HTN week 0;
$^{\#}p<0.05$ vs GC; $^{\tau}p<0.05$ vs SM (t-test or 2 way ANOVA)

- Betalains and polyphenols are associated with a high antioxidant capacity, which may reduce vascular risk associated with MS.
- MS comorbidities lead to endothelial dysfunction, increasing reactive oxygen species and decreasing nitric oxide, contributing to HTN.
- The vasodilator effect of CJG_L is endothelium-independent and may involve blocking $Ca^{2}+$ or K+ channels in smooth muscle cells.

CONCLUSION

The CJG_L show a vasodilator effect endothelium-independent in the thoracic aorta of rats with MS+HTN, likely attributable to its rich content of secondary metabolites.

FUTURE WORK / REFERENCES

It is necessary to identify the secondary metabolites responsible for the vasdilator effect. Additionally, the effect of its administration will be studied in an *in vivo* rat model of MS.

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