POTENTIAL EFFECTS ON A COMBINATION OF *ZINGER OFFICINALE, ALLIUM SATIVUM, CITRUS LEMON*, HONEY, AND *MALUS DOMESTICA* VINEGAR (ZACA) EXTRACT IN RATS FED WITH HIGH CHOLESTEROL DIET

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ABSTRACT

Hyperlipidemia is abnormal of lipid metabolism that presents in the bloodstream. The study aims is to investigate the effects on a combination mixture of Zinger officinale, Allium sativum, Citrus lemon, honey, and Malus domestica vinegar (ZACA) in rats fed with high cholesterol diet (HCD). 36 male Sprague dawley rats were divided into 6 groups. ZACA extracts (1mg/kg, 3 mg/kg, 5 mg/kg of bodyweight) were administered along with high cholesterol diet (HCD) for 18 weeks. Simvastatin 10 mg/kg of bodyweight was used as a control. In vitro; ZACA extracts had oxygen radical absorbance capacity (ORAC) of 2000 µmol TE/100 mL, total phenolic content (TPC) is 7537 ± 54.5%, 2,2-diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging activity is 27.34 ± 2.71% , Elastase inhibitory assay is (29.29 ± 1.65% and lipoxygenase inhibitory assay is 98.58 ± 1.42%. The high performance liquid chromatography (HPLC) detected the presence of Hesperidin in ZACA extract that acts as anti-oxidative and anti-inflammatory agent. In vivo; ZACA extract decreased bodyweight, adipose tissue weight, and improved lipid profiles (total cholesterol, triglycerides, low density lipoprotein, and high density lipoprotein). The results demonstrate that ZACA extracts have a protective effect against hyperlipidemia and beneficial as dietary supplement.

INTRODUCTION

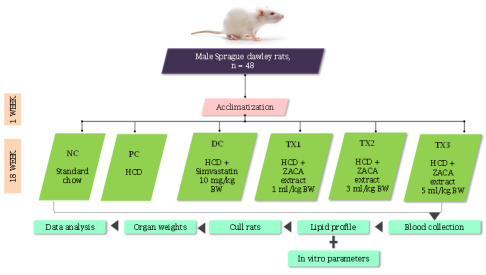
HYPERLIPIDEMIA

Excess amount of lipids in the bloodstream

Europe has the highest prevalence of high cholesterol (54%)
World health organization (WHO), 2015

In Malaysia, prevalence of high cholesterol among adults (47.7%)
National Health and Morbidity survey (NHMS),2015

METHODOLOGY



RESULT

In vitro parameters	Value	Range
ORAC value (µmol TE/100mL)	2000	-
Elastase inhibitory activity (%)	29.29 ± 1.65 (M)	High(H): 55-100% ; Good(G):30-54% ; Moderate (M): 10 – 29%, Low (L): 1 – 9%
Lipoxygenase inhibitory assay (%)	98.58 ± 1.42 (H)	High (H): 70 – 100%, Moderate (M): 50 – 69%, Low (L): 0 – 49%
DPPH (%)	27.34 ± 2.71 (L)	High (H): 70 – 100%, Moderate (M): 50 – 69%, Low (L): 0 – 49%
TPC (%)	7537 ± 54.5	-

Table 1:ORAC value, Elastase inhibitory activity, Lipoxygenase inhibitory assay, DPPH free radical scavenging activity and total phenolic of ZACA extracts

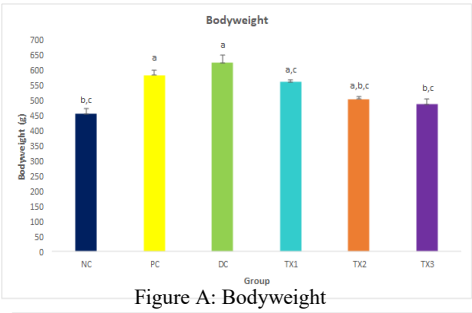


Figure A: Bodyweight

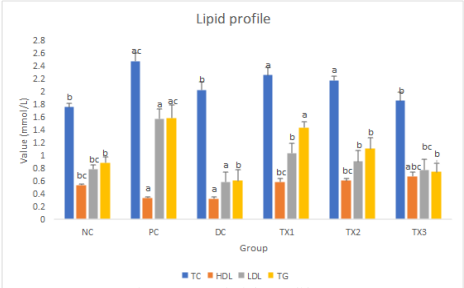


Figure B: Lipid profile

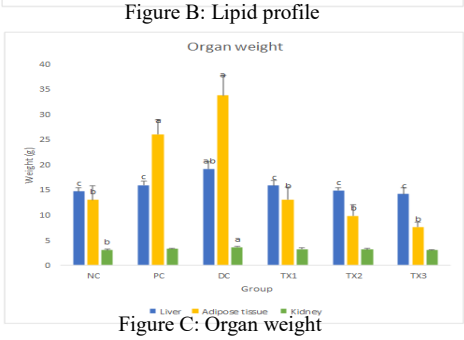


Figure C: Organ weight

DISCUSSION

ZACA consists hesperidin is a type of flavonoid that enhance fat oxidation that leads to fat deposition that causes reduction in bodyweight, adipose tissue weight and improved lipid profile (↓ total cholesterol (TC), triglycerides(TG), low density lipoprotein (LDL) and ↑ high density lipoprotein (HDL).

CONCLUSION

There is effect of ZACA extracts on bodyweight, lipid profile and organ weight.

REFERENCES

The National Health and Morbidity Survey 2015 (NHMS). Non-communicable diseases, risk factors and other health problems. Retrieved from http://www.moh.gov.my/moh/resources/nhmsreport2015vol2.pdf.

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Abbreviations: ORAC: Oxygen Radical Absorbance Capacity, DPPH: 2,2-diphenyl-1-picrylhydrazyl, TPC; total phenolic content