

Matoa Peel Compounds, Including Lipase Inhibitors, Modulate Visceral and Hepatic Adiposity



Male rats, 4 weeks old (N = 24)

MPP $\xrightarrow{\text{ethanol}}$ alcohol extraction + ethanol residue (AR) + ethanol extract (EX)

MPP $\xrightarrow{\text{water}}$ water extraction + water residue (WR) + water extract

Dietary groups (n = 6, each)



Physiological assessments

Visceral fat accumulation, hepatic lipid deposition, and serum lipid profiles



Extraction of bioactive compounds

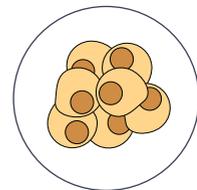
Activity-guided fractionation and structural identification by NMR



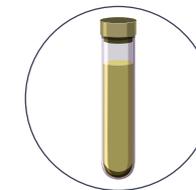
Mechanistic evaluation

Pancreatic lipase inhibition assay (INFOGEST) and free fatty acid release quantification

Key findings



WR retained adiposity and hepatic lipid-modulating effects; AR showed no effect

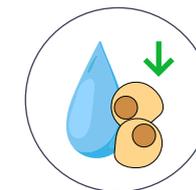


EX inhibited pancreatic lipase (IC₅₀ = 740 µg/mL)



Identified inhibitors

- Hederagenin saponin (IC₅₀ = 149 µmol/L)
- Protocatechuic acid (IC₅₀ = 404 µmol/L)



Simulated digestion

EX and protocatechuic acid reduce free fatty acid release

In vivo effects



- ↓ Visceral fat accumulation
- ↓ Hepatic TG and TC
- ↓ Serum TG

Visceral adiposity and hepatic lipid-modulating effects of matoa peel are linked to ethanol-soluble compounds, including those that inhibit pancreatic lipase