



Hepatoprotective effects of a cricket-enriched pasta in an *in vitro* intestine-liver model under oxidative stress conditions

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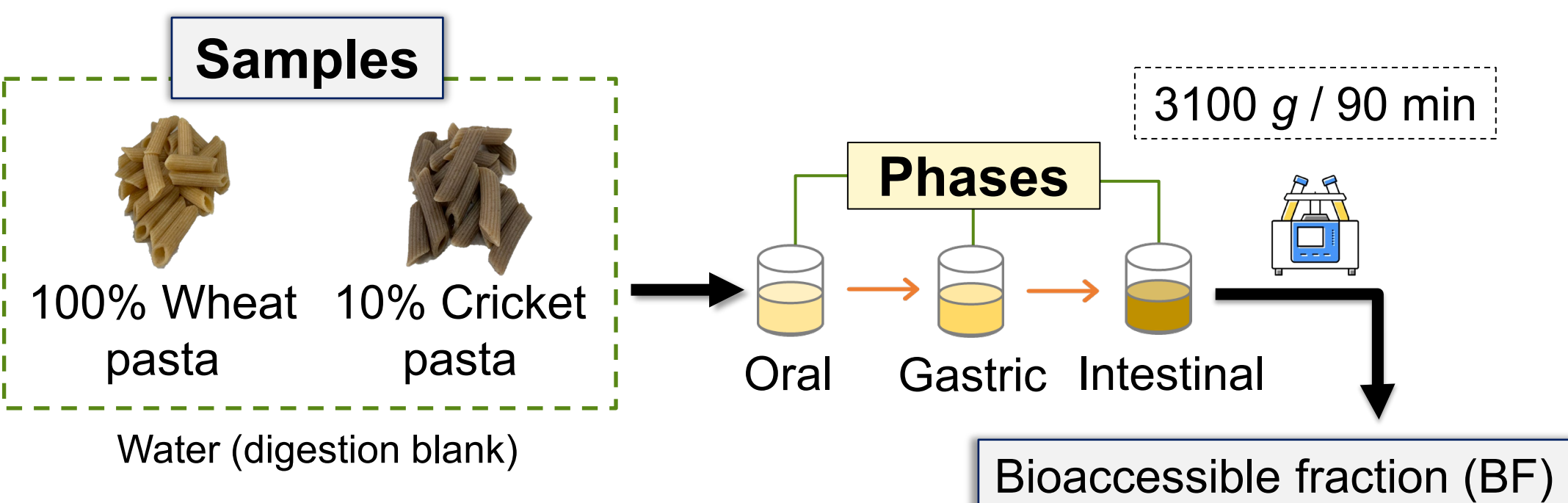
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INTRODUCTION & AIM

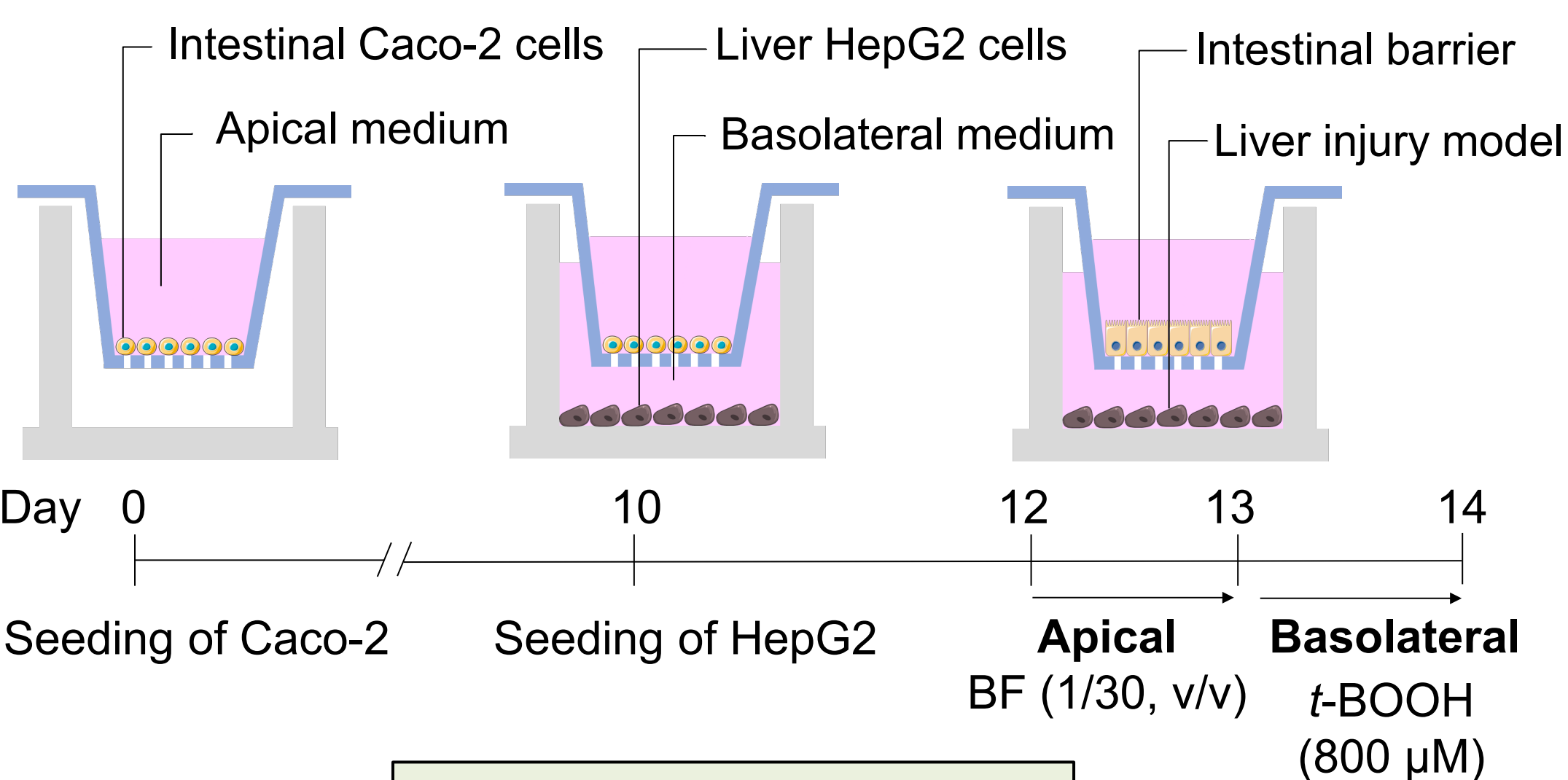
Oxidative stress contributes to liver diseases by promoting inflammation and endothelial dysfunction¹. Edible insects like the house cricket (*Acheta domesticus*) are promising bioactive sources (*i.e.*, bioactive peptides), but their hepatoprotective effects remain unknown. This study evaluated the hepatoprotective potential of cricket-enriched pasta compared to conventional wheat pasta using a bicameral intestine-liver *in vitro* model, where Caco-2 cells function as an intestinal barrier and HepG2 cells are exposed to *tert*-butyl hydroperoxide (*t*-BOOH)-induced oxidative stress to simulate liver injury.

METHOD

Simulated gastrointestinal digestion (INFOGEST 2.0)²



Bicameral intestine-liver *in vitro* model



Biomarker assessment

Luminex®-based multiplex assay

Basolateral medium

Inflammation-related cytokines

Anti-inflammatory (IL-10)
Pro-inflammatory (IL-1 β)

Endothelial dysfunction

Endotelin-1 and ICAM-1

UPLC-MS/MS analysis³

Intracellular (HepG2)

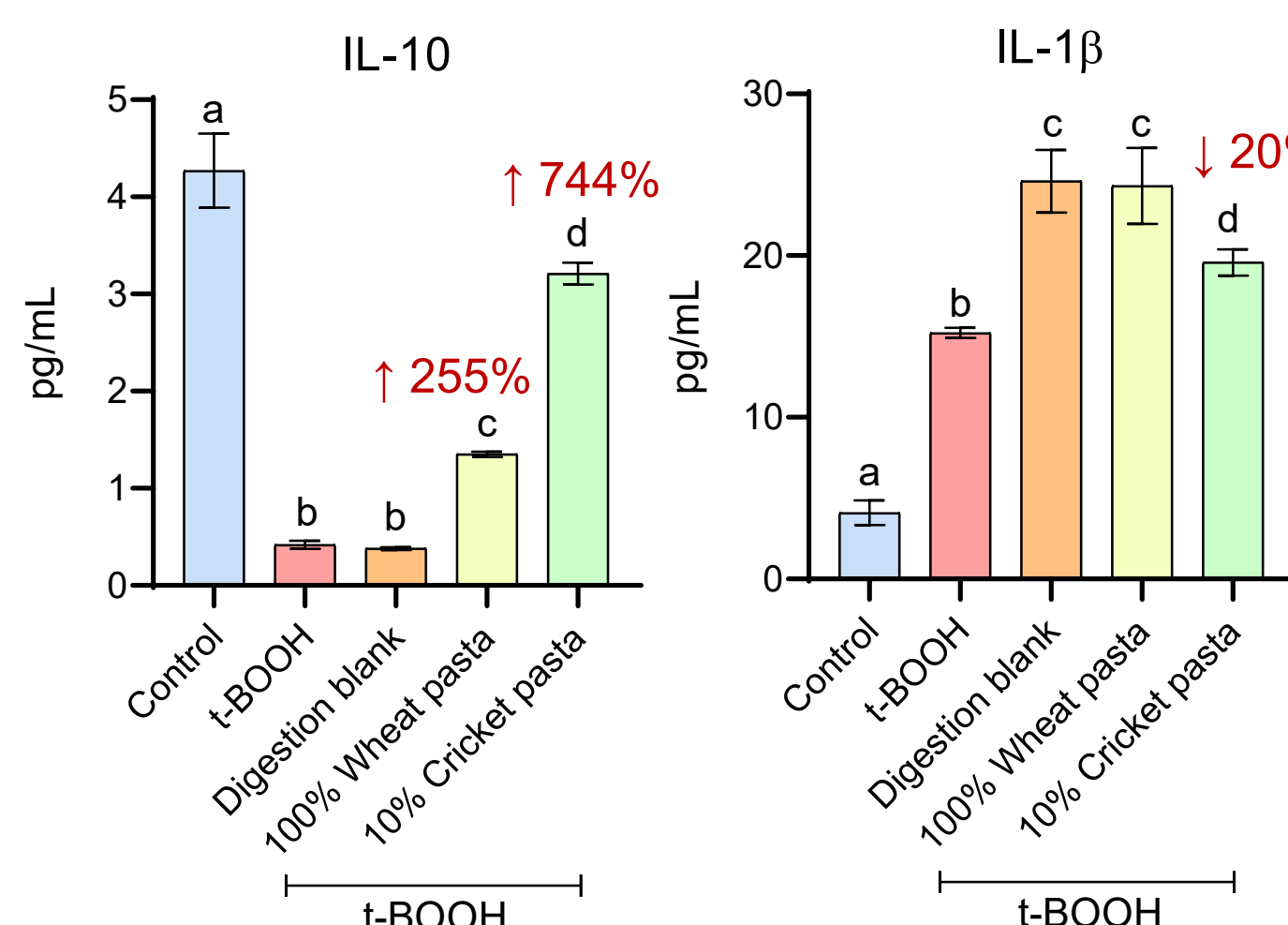
Oxidative stress

Glutathione (GSH/GSSG)
Ophthalmic acid
Protein damage (o-Tyr/Phe)

RESULTS & DISCUSSION

Statistically significant differences ($p < 0.05$) between conditions are indicated by different letters (a-d)

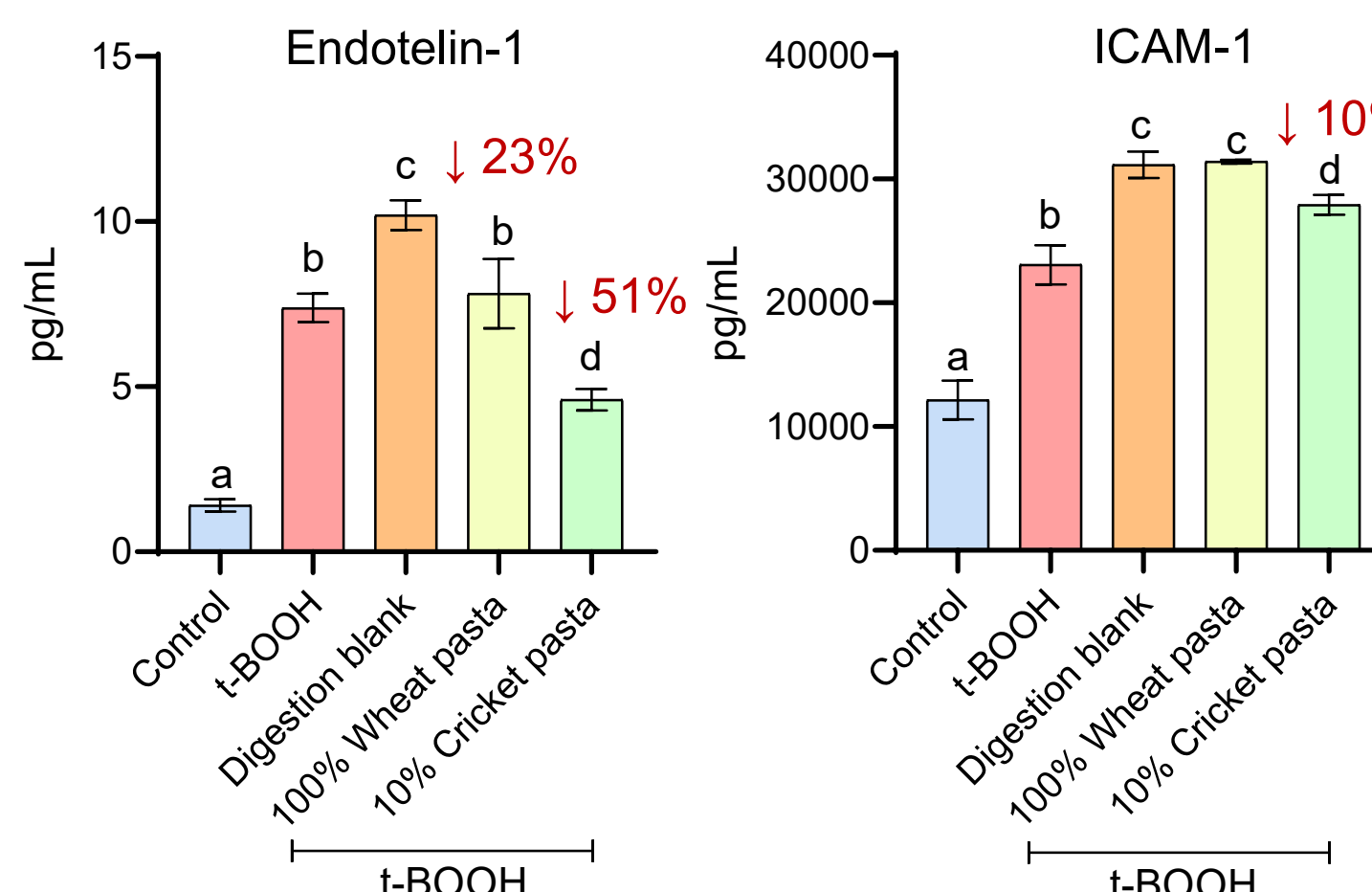
Modulation of the inflammatory response



Greater anti-inflammatory effect of cricket pasta

Cricket-derived peptides with anti-inflammatory activity in HaCaT keratinocytes⁴

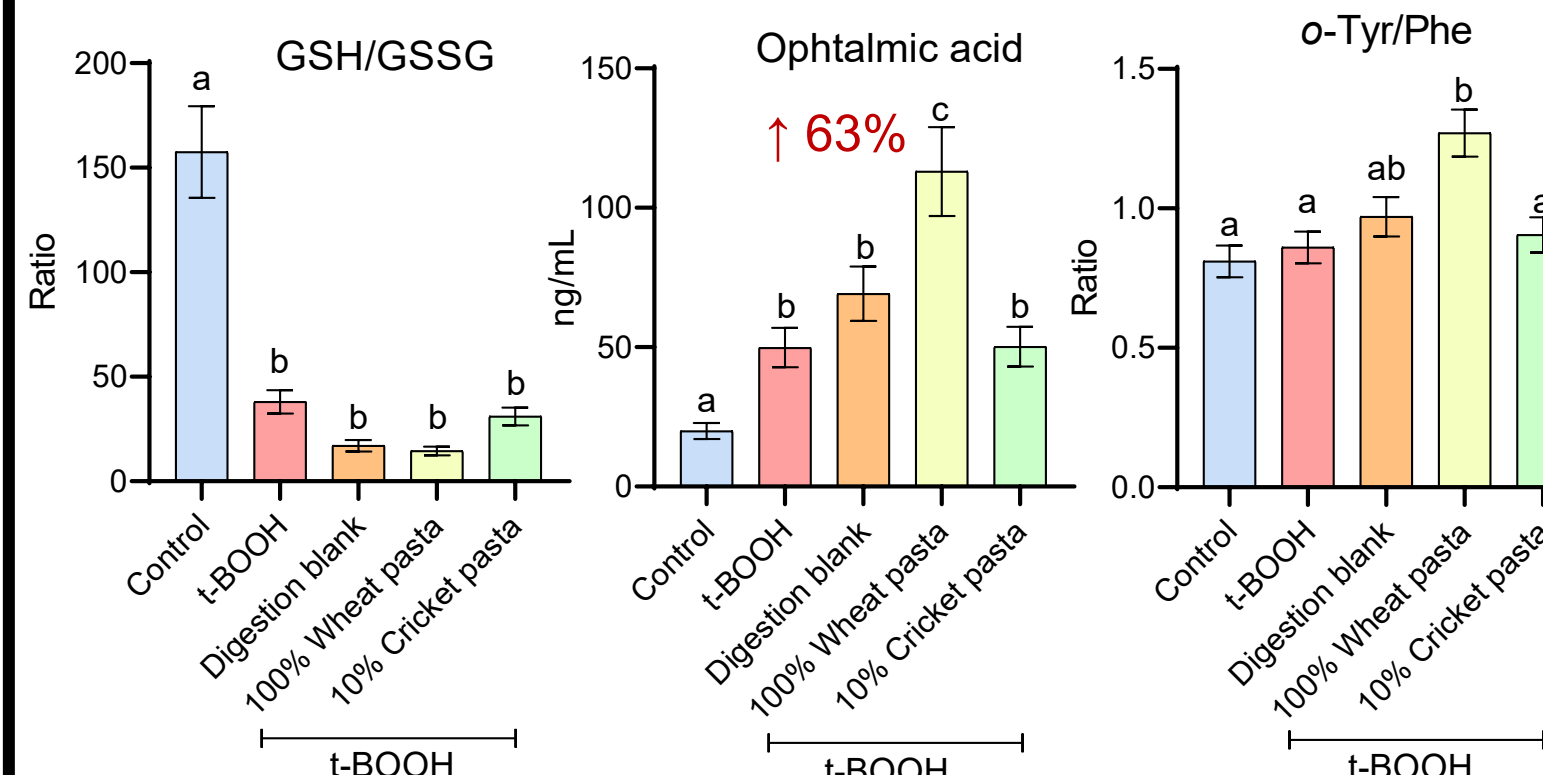
Improvement in vascular biomarkers



Improvement of endothelial dysfunction

Consistent with improved vascular dysfunction in rats treated with cricket hydrolysates⁵

Lack of protection against oxidative stress



100% Wheat pasta exacerbates oxidative stress

Possible interference with the previously described antioxidant properties of cricket⁶

CONCLUSION

Cricket pasta showed anti-inflammatory and endothelial-modulating effects in an *in vitro* liver injury model. Although oxidative stress was not improved, cricket pasta exhibited a more favorable redox response, highlighting the importance of food matrix composition in functional food design.

REFERENCES

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