

**Foods  
2021**

# The 2nd International Electronic Conference on Foods Future Foods and Food Technologies for a Sustainable World

15-30 OCTOBER 2021 | ONLINE



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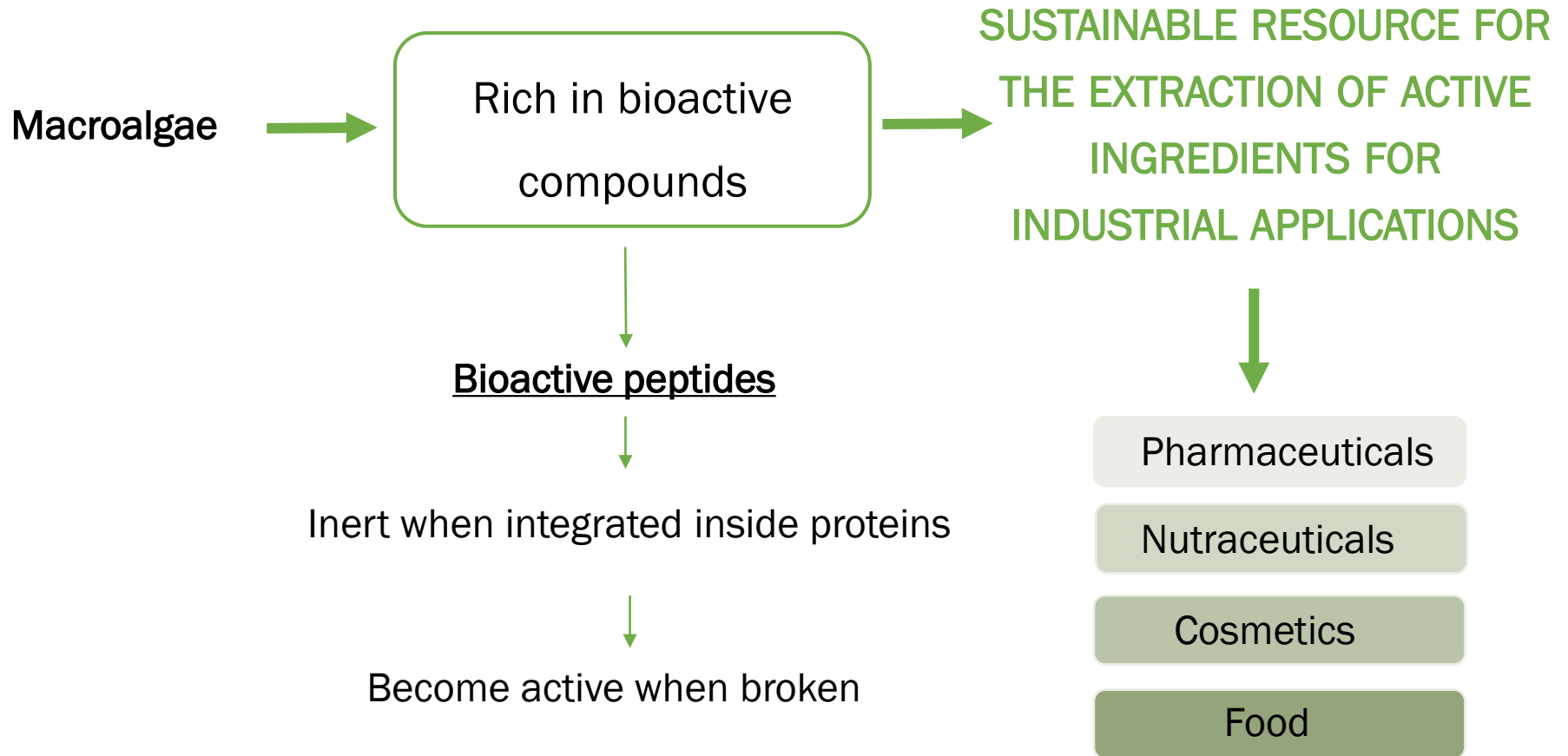
Valorização integral dos  
recursos marinhos

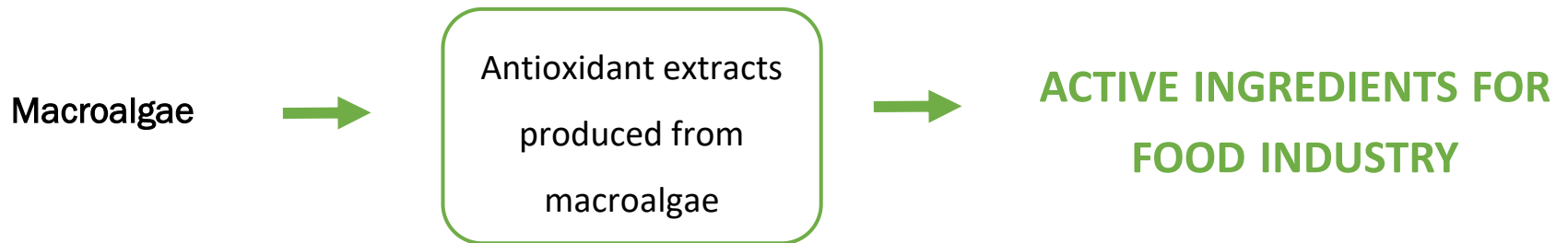
## ***In vitro* Gastrointestinal Digestion impact on the antioxidant activity of extracts produced from the macroalgae *Gracilaria gracilis* and *Ulva rigida***

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**Advantages of the incorporation of macroalgae antioxidant extracts in food products:**

- easily absorbed by the gastrointestinal tract, when compared to the intact macroalgae;
- can be used to develop functional food with benefits for human health;
- Can open opportunities as food preservatives;
- contribute to sustainable development.

*Next generation of high value products?*

**Problems of the incorporation of macroalgae antioxidant extracts in food products:**

- The extracts need to resist to several factors that can lead to a decrease of their bioactivities
  - ✓ Bioactivities must be maintained after enzymes action and gastric acids in the stomach

**Gastrointestinal digestion studies are important for understanding the bioavailability of the extracts**

- Understand if antioxidant activity is maintained after digestion or if it is necessary to develop strategies to protect the extracts

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*Gracilaria gracilis*

*Ulva rigida*

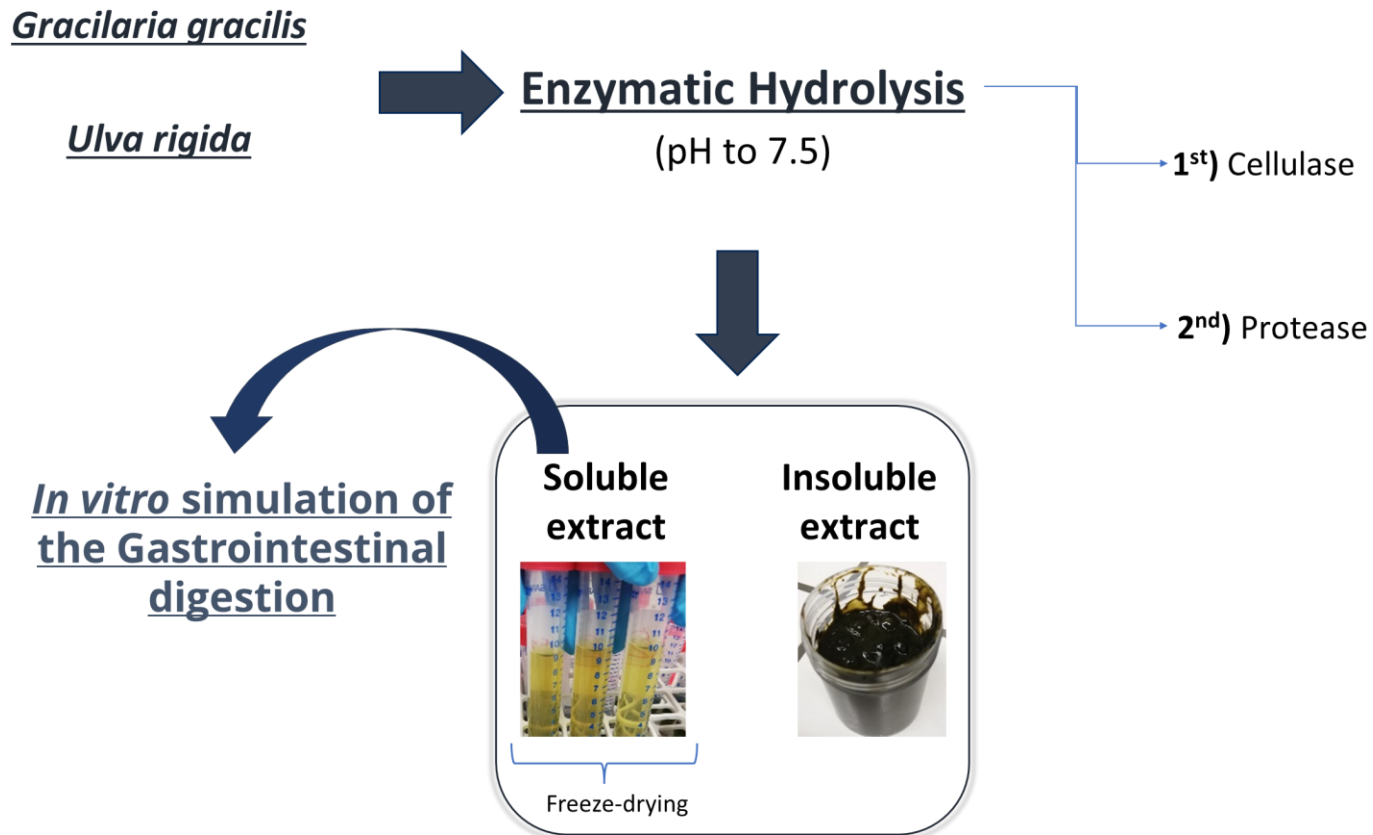


Produce water soluble  
extracts rich in  
proteins and  
antioxidant peptides.

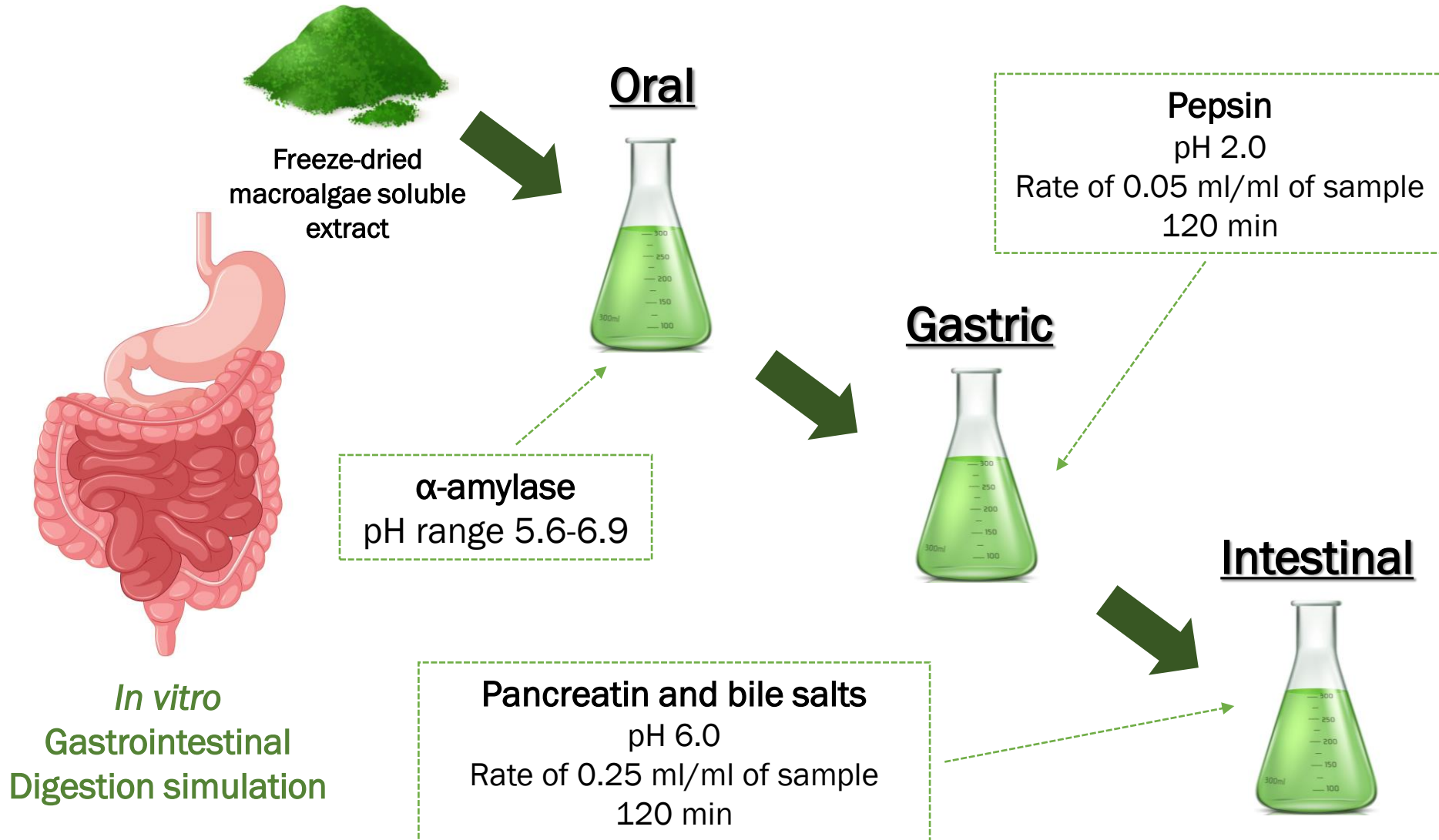


**UNDERSTAND IF THEIR ANTIOXIDANT  
ACTIVITY IS MAINTAINED AFTER  
GASTROINTESTINAL DIGESTION**

*Evaluate the macroalgae extracts  
potential as functional food  
ingredients*



**Figure 1:** Hydrolysate production scheme.



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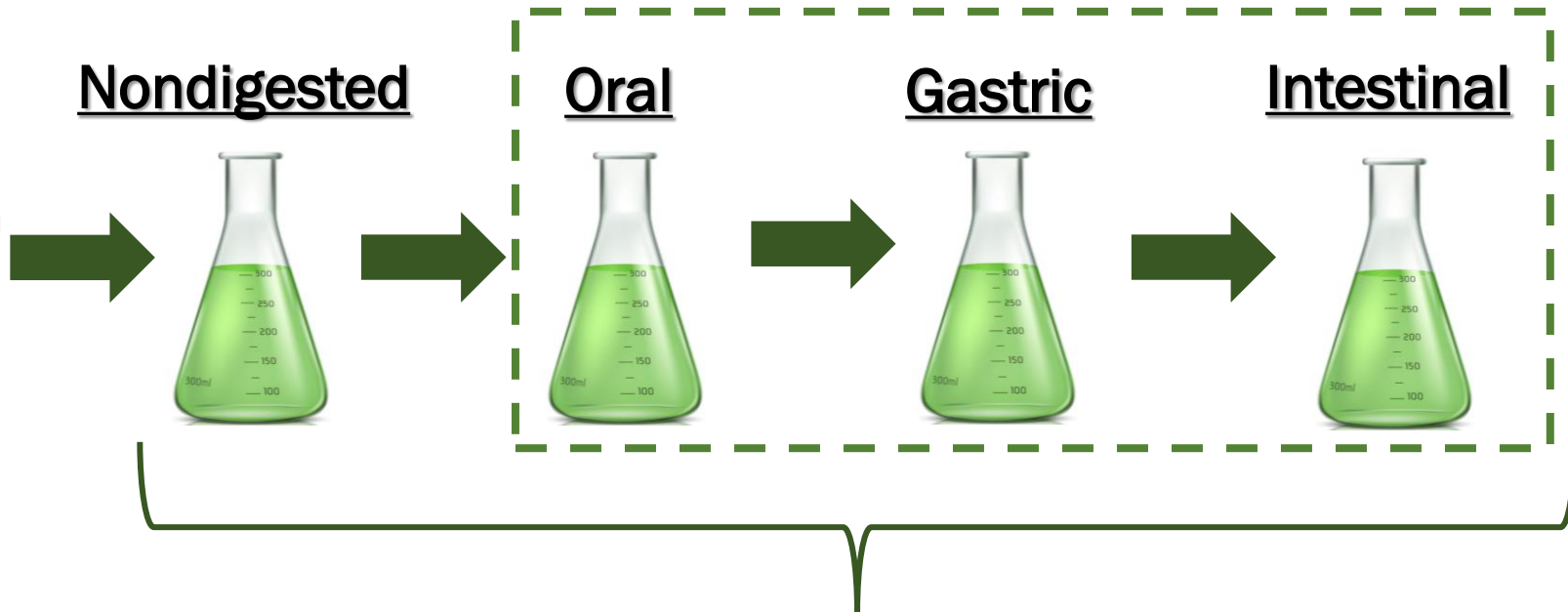
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*In vitro* Gastrointestinal Digestion simulation



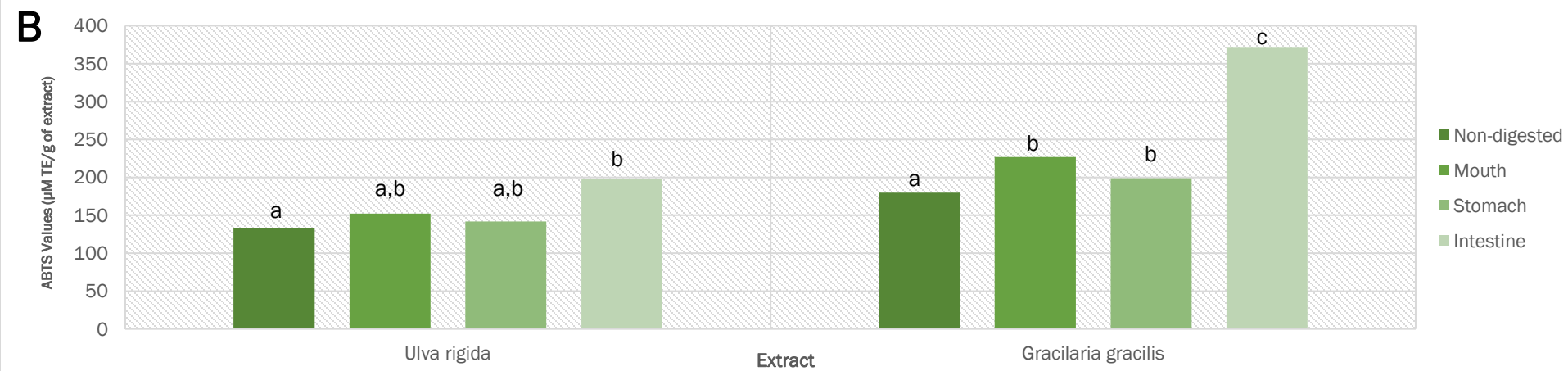
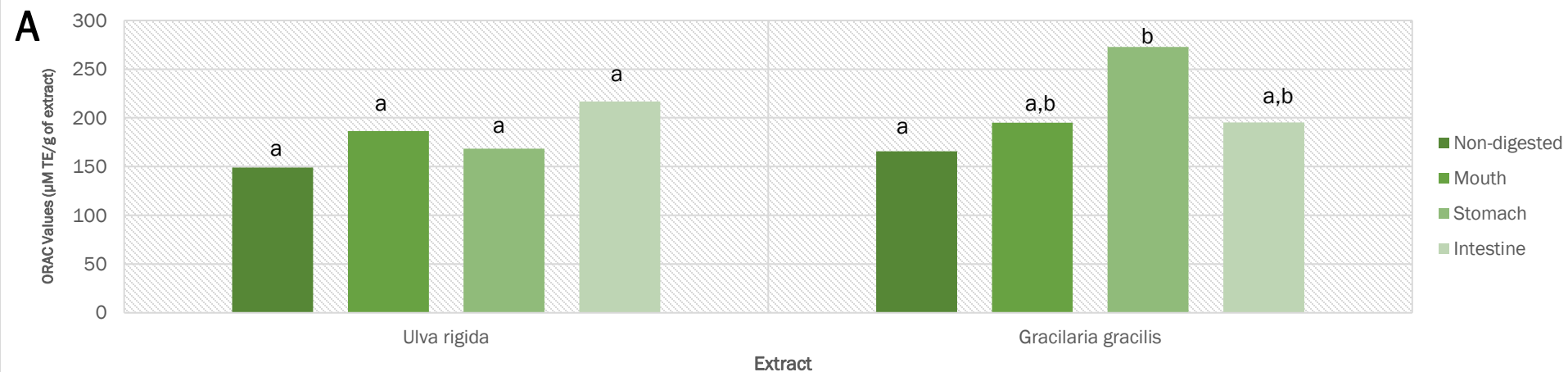
Freeze-dried  
macroalgae  
soluble extract



Oxygen Radical Absorbance Capacity (ORAC) assay

ABTS Radical Scavenging Assay





**Figure 2:** Antioxidant activity of *U. rigida* and *G. gracilis* hydrolysates by ORAC (A) and ABTS (B) assays through the gastrointestinal tract. Statistically significant differences ( $p < 0.05$ ) between GI tract phases are indicated by different letters.

- It was observed an increase in the antioxidant activity for both extracts after some GI digestion phases when compared to the nondigested control
  - ✓ may be explained by the formation of more bioactive compounds, such as smaller peptides by the action of digestive enzymes.
  - ✓ Even when this increase is not statistically different, it represents an important result because there is no loss of the antioxidant potential of the hydrolysates after GI digestion.
- *In vitro* GI digestion simulation allowed to confirm the potential of the hydrolysate's bioactivity after gastrointestinal digestion

**Potential ingredients for the  
development of functional food**

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