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BIOACTIVITY OF LACTOBACILLUS-FERMENTED PLANT BEVERAGES ON STRESSED COLON CELLS AND *C. elegans* MODELS – Preliminary Study

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Fermented foods have been historically a part of our diets. In addition to preserving food and to making certain foods edible, fermentation also generates transformed and new bioactives compounds posing advantageous functional properties. Existing observational studies link regular consumption of fermented foods with a wide range of health-promoting attributes, raising public interest towards these products containing probiotics. In agreement with the consumers' demand and given the trend to evolve towards more sustainability, fermented plant beverages represent one of the best opportunities. However, the beneficial value of such functional fermented plant beverages needs to more documented through scientific data.

Material & methods

Infusion in hot water at 0.05% of green tea, pomegranate peel and thyme, and at 0.01 % for rosemary extract

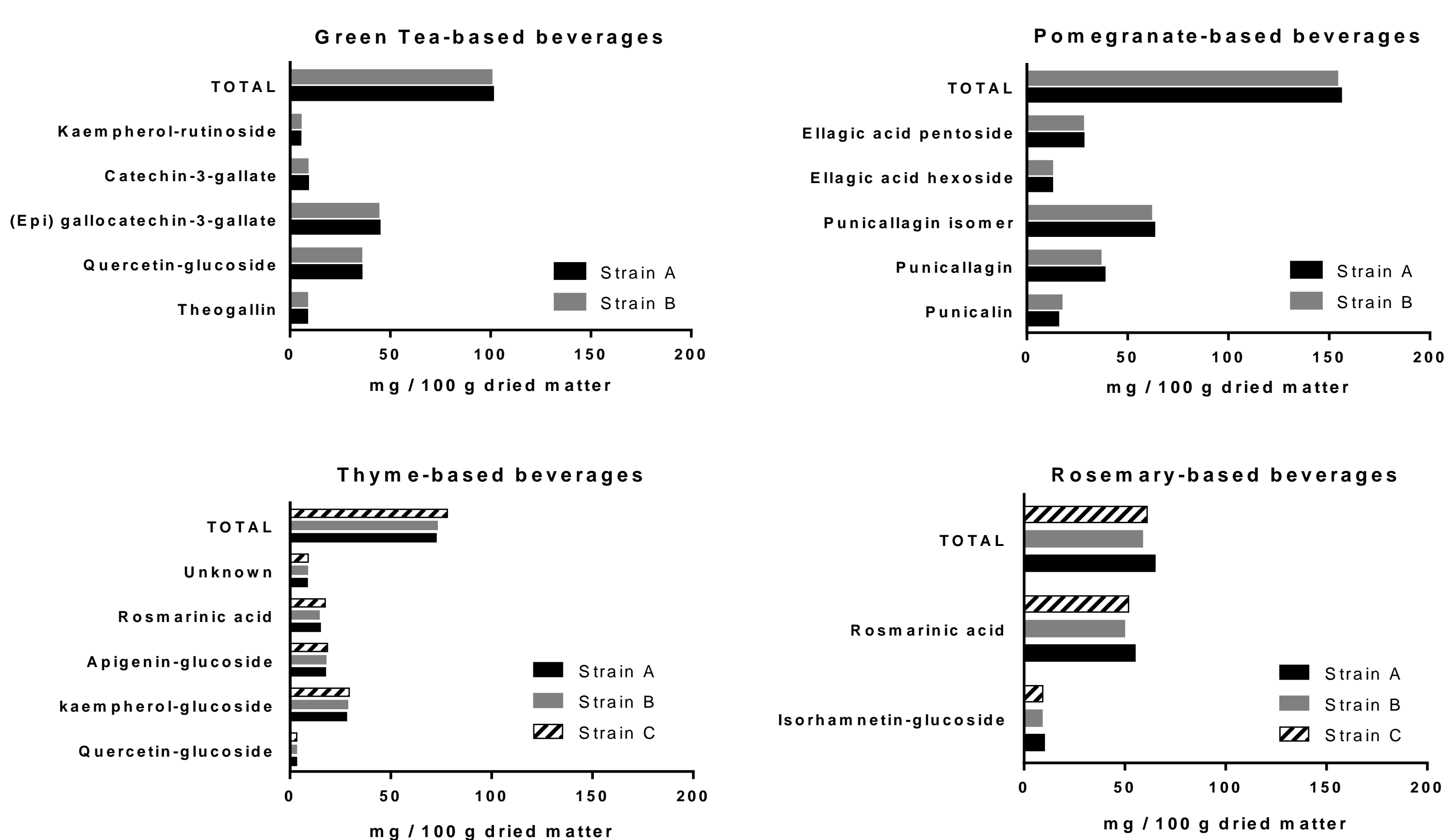
Lactobacillus fermentation (48h)

- Strain A: *L. plantarum* 129 J1 (1%)
- Strain B: lactic acid bacterium isolated from fermented black carrot juice (1%)

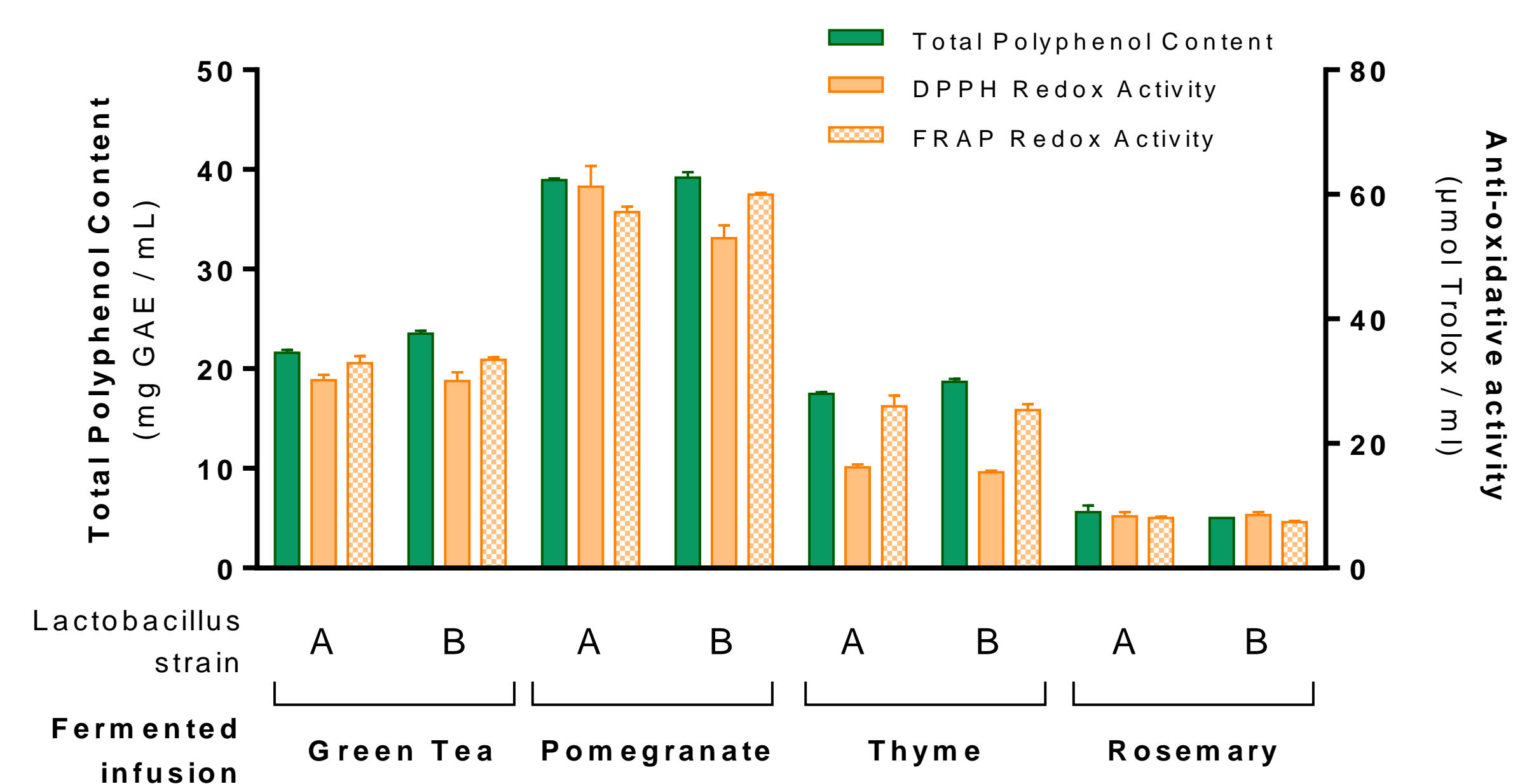
Clarification & Pasteurization

- Identification and quantification of the main phenolic compounds by LC-MS/MS
- Total polyphenol content by Folin-Ciocalteu method
- *In vitro* anti-oxidant activities (FRAP, DPPH)
- Anti-inflammatory activity on intestinal cell model
- *In vivo* bioactivity in *C. elegans* model

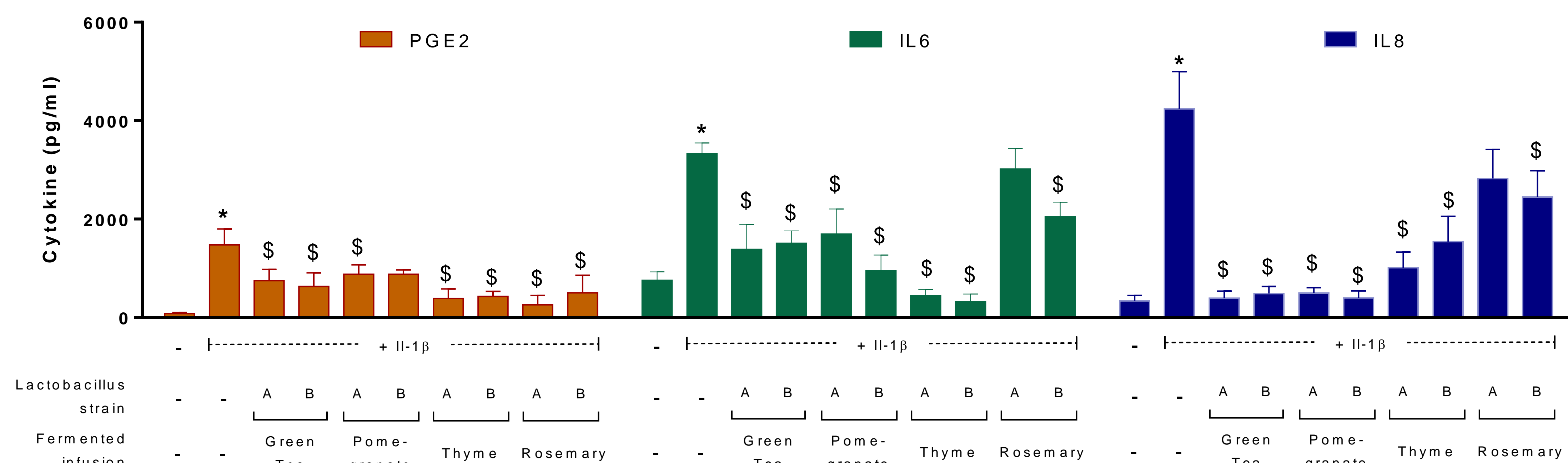
Polyphenol content & *in vitro* antioxidant activity



Lactobacillus fermentations do not modify qualitatively and quantitatively the polyphenol content of beverages. These fermented beverages exhibit **antioxidant activities** highly correlated to the total polyphenol content.



Anti-inflammatory activity on intestinal cells

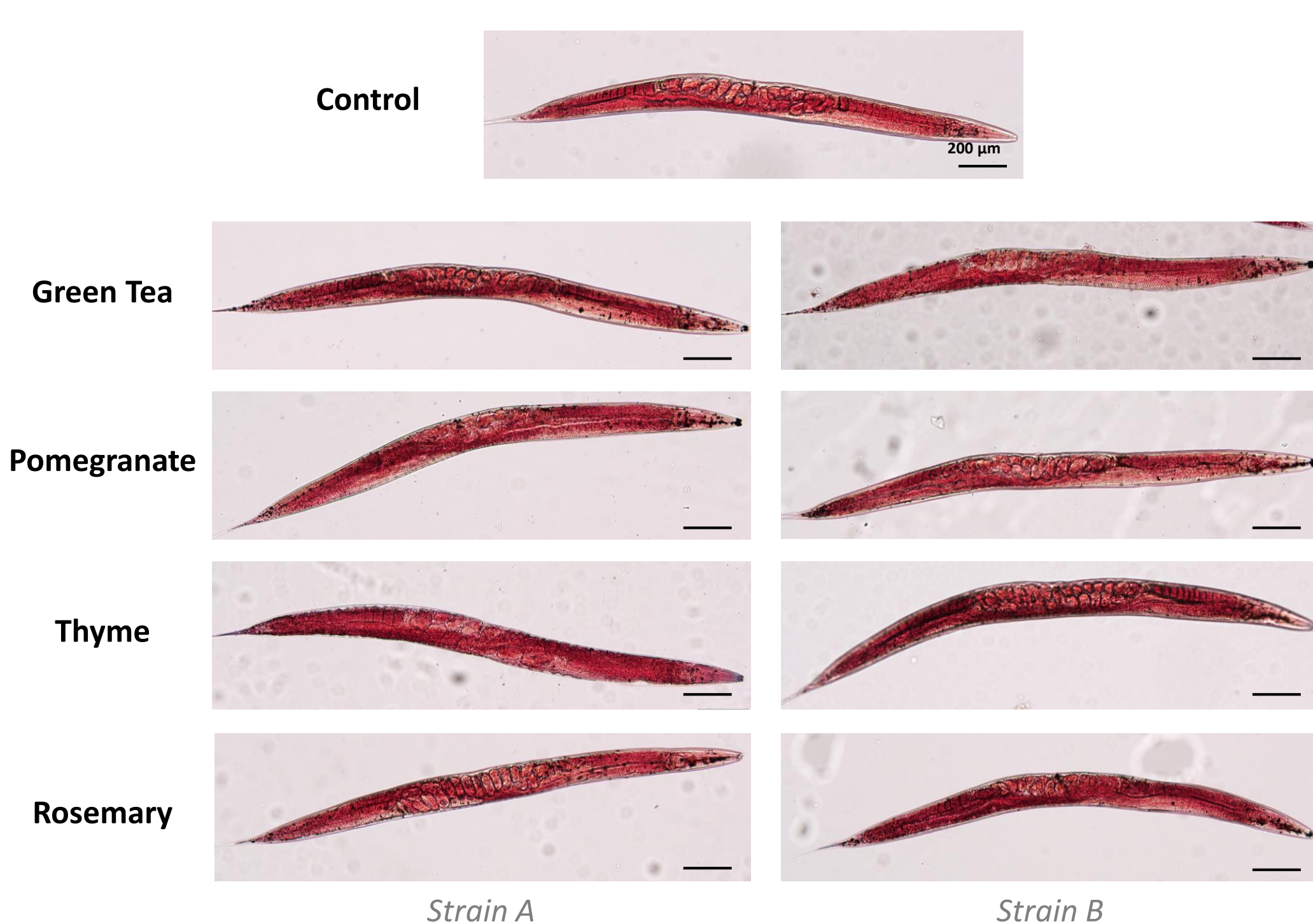


Lactobacillus-fermented beverages exhibit **anti-inflammatory activity** as shown by the decrease of PGE₂, IL6 and IL8 secretion by intestinal (CCD18-Co) cells stimulated by interleukin 1-β.

CCD18-Co cells were incubated in culture media supplemented with 2.5% fermented products +/- 1 ng/ml IL-1β for 18 hours.

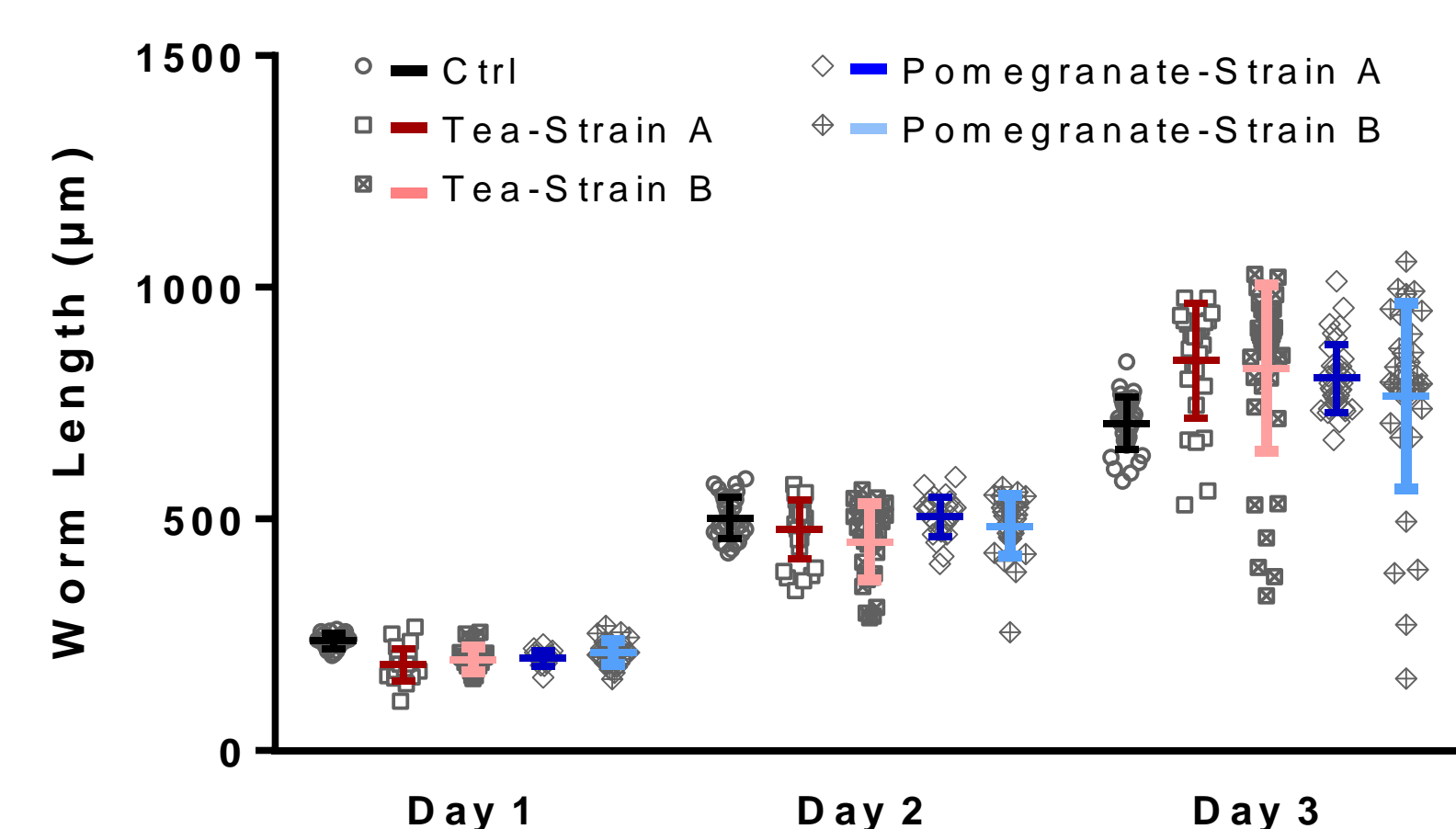
* p < 0.05 compared to unstimulated cells; \$ p < 0.05 compared to IL-1β-stimulated cells (t-student)

Bioactivity in *C. elegans* – Preliminary results



Lactobacillus-fermented beverages do not seem to alter *C. elegans* growth as shown by the 3 days follow-up of the worm length and the lipid accumulation at day 4.

Eggs were exposed overnight to fermented water drinks (1/10) or control (M9 medium) and then seeded on NGM for 4 days. Adult worms were fixed and stained by Oil Red O staining (on the right).



In conclusion, these preliminary results show that Lactobacillus-fermented beverages from plants are rich in phenolic compounds and exhibits bioactive properties of potential interest for human health.