

Influence of processing parameters on coffee polysaccharides hypocholesterolemic potential

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Introduction

1 Cholesterol: friend or foe?

Cholesterol is an essential molecule for:

- Membrane structure and function
- Precursor of bile salts, hormones and vitamins

!! In excess can increase the risk of cardiovascular diseases¹

2 Current hypocholesterolemic strategies and drawbacks

- Pharmacological: !! Costly, !! Severe side effects
- Food ingredients: !! Reduced efficiency and selectivity, !! Hydrophobic matrix, !! Intake time
 - Phytosterols
 - PUFA
 - Dietary fibers

3 Heart healthy coffee potential

4 Cholesterol reducing properties

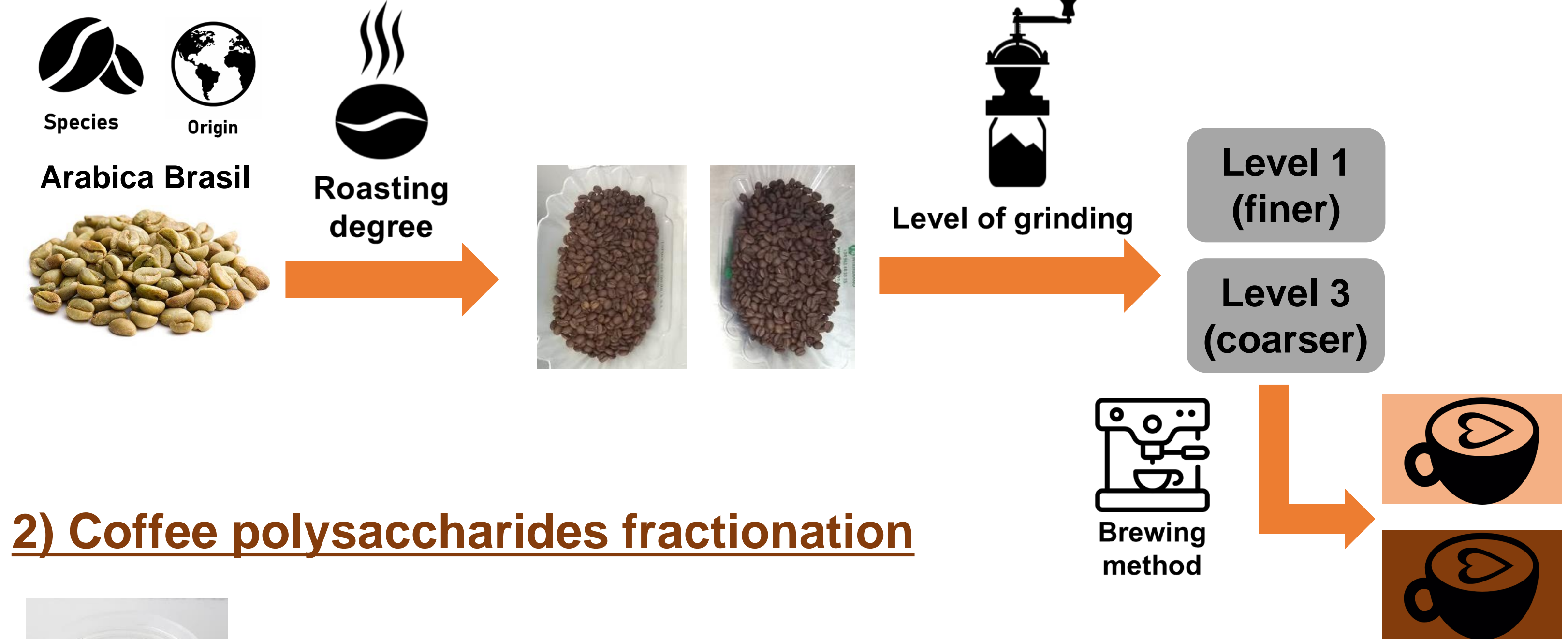
How can these changes influence polysaccharides hypocholesterolemic properties?

Objectives

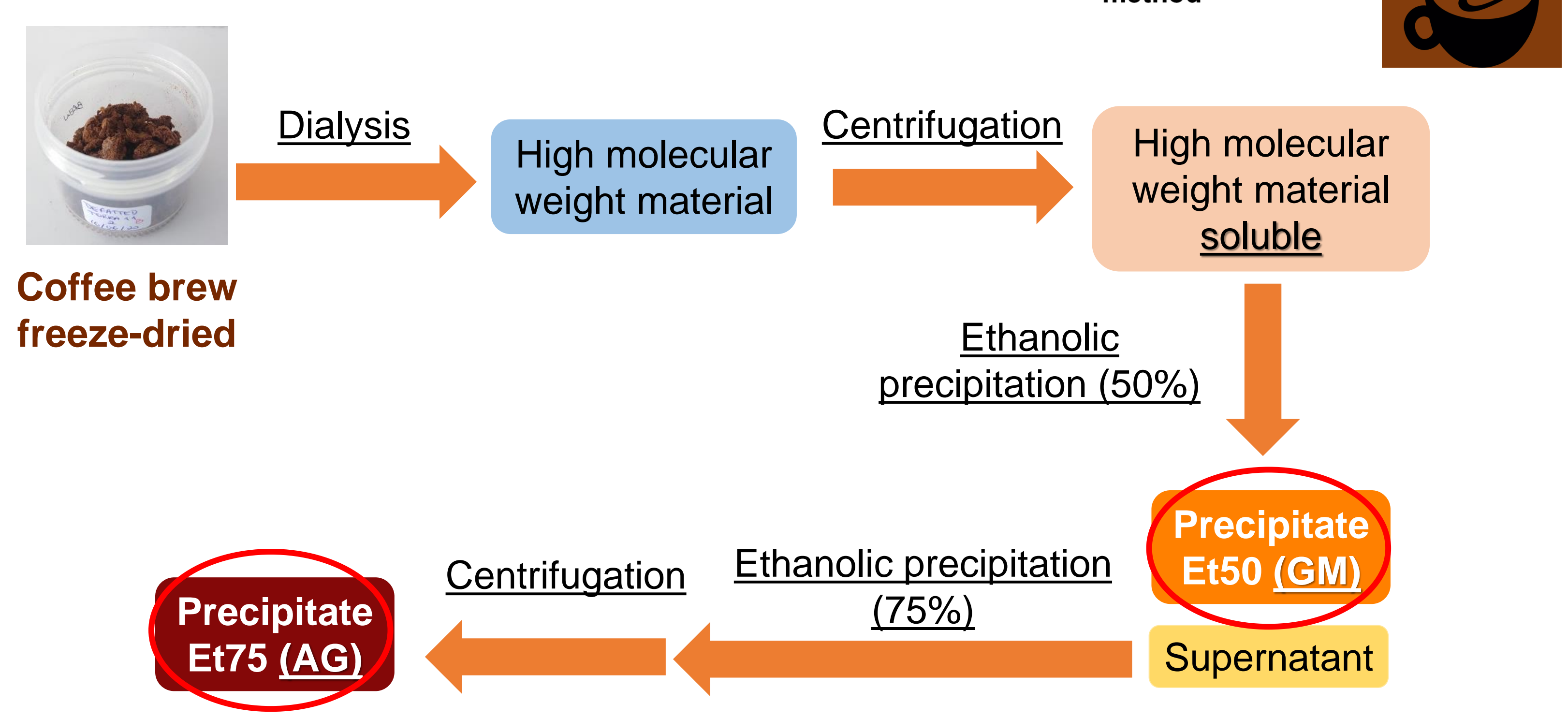
- Evaluation of hypocholesterolemic activity of coffee with different roasting degrees and levels of grinding, and enriched with polysaccharides;
- Characterization of samples regarding sugar composition;
- Cholesterol bioaccessibility assays using an *in vitro* intestinal model, to measure of samples hypocholesterolemic potential.

Methods

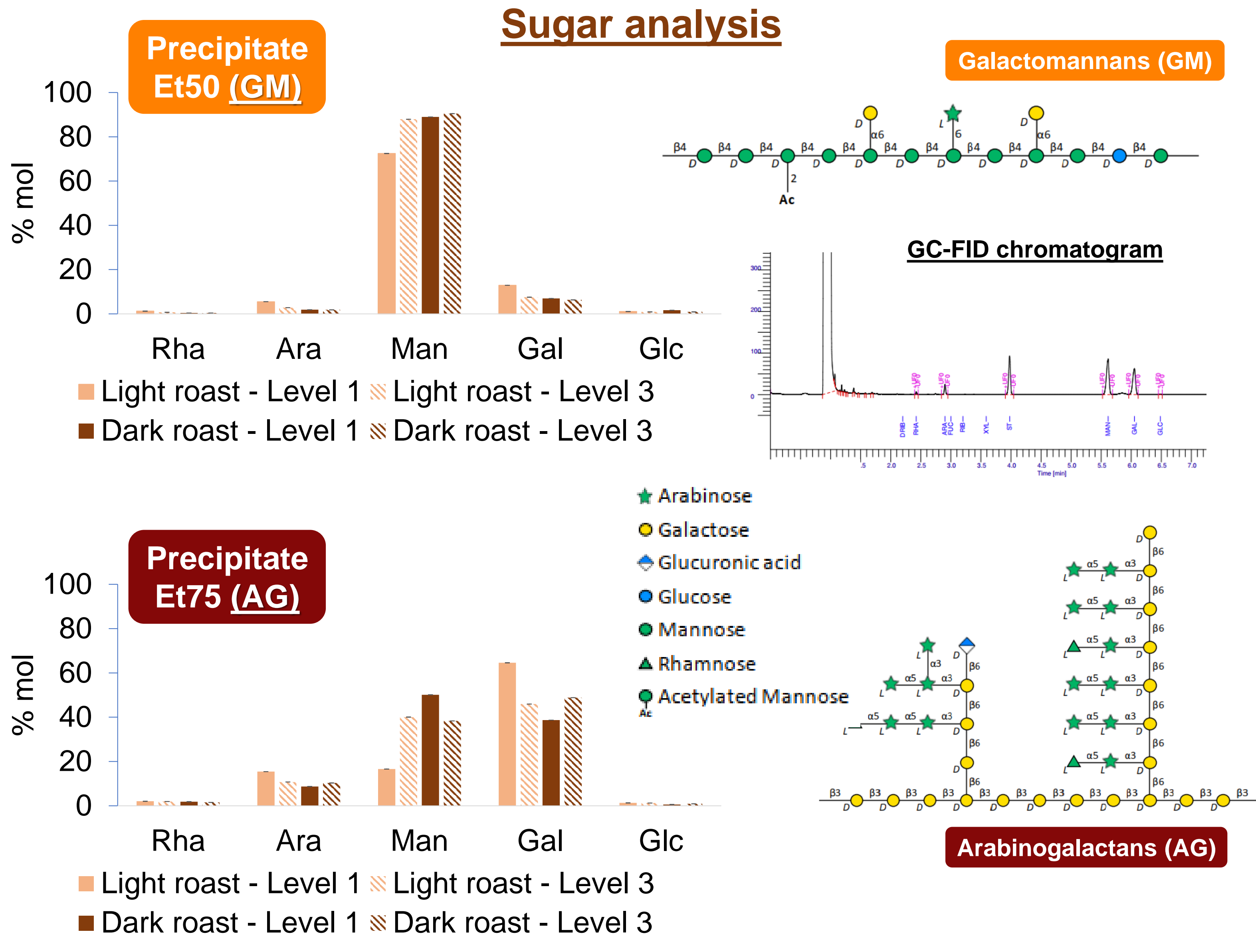
1) Coffee brew preparation



2) Coffee polysaccharides fractionation



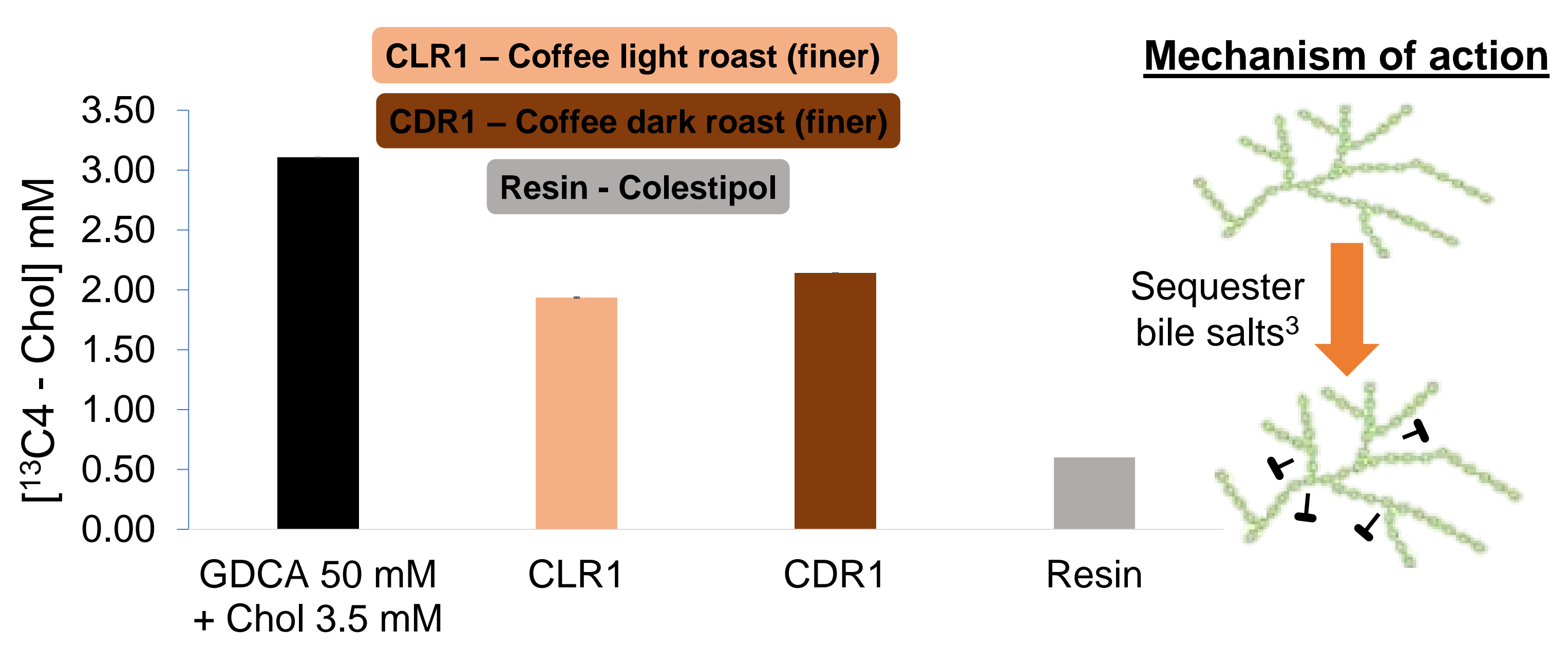
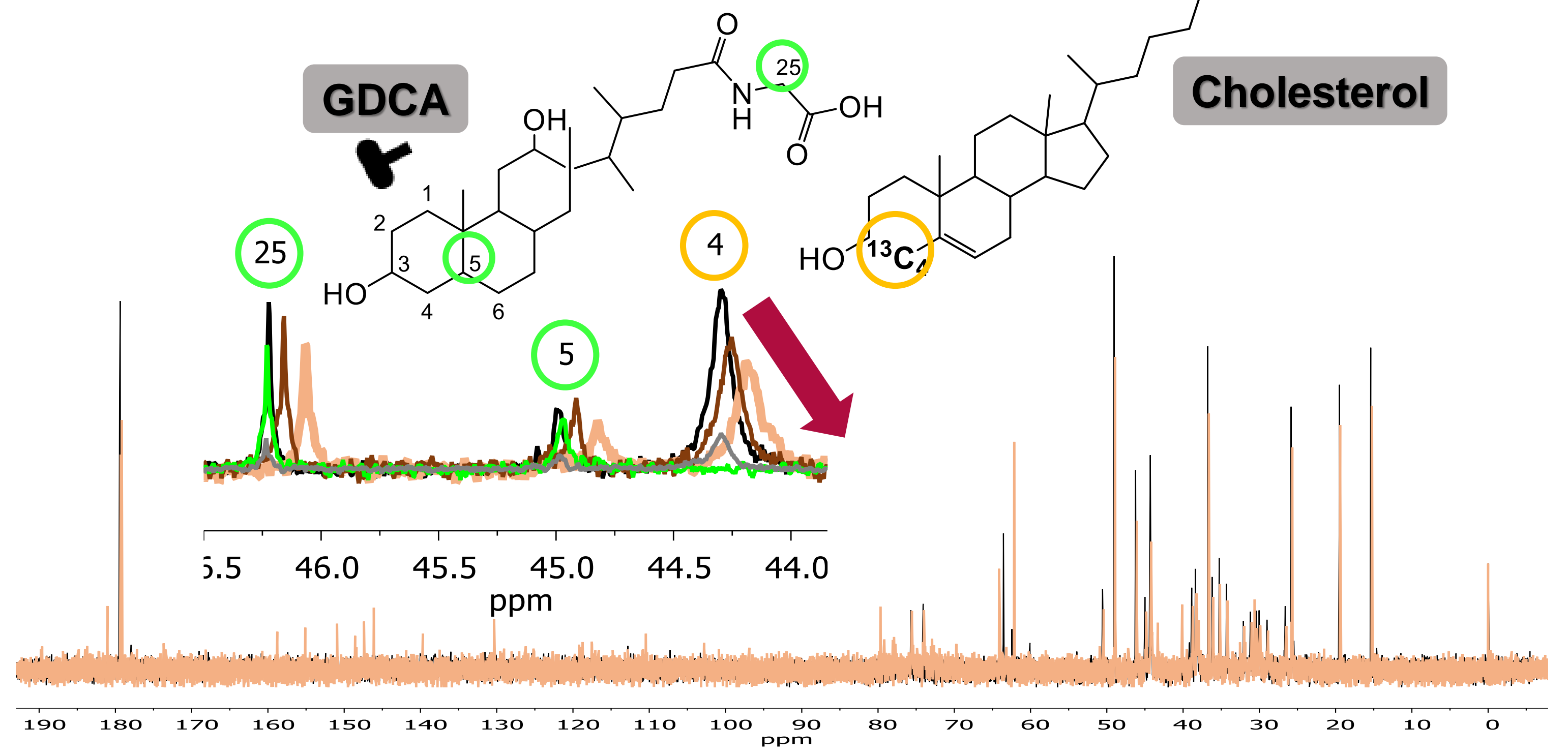
Results



Cholesterol bioaccessibility assays: ¹³C - qNMR

In the presence of coffee extracts cholesterol solubility decreases

In vitro intestinal model



Conclusions

- Different roasting degrees affect hypocholesterolemic properties of coffee brew;
- Coffee enriched with AG fractions was more effective in decreasing cholesterol than the ones enriched with GM fractions;
- Coffee brew affect cholesterol bioaccessibility in a large extent than GM and AG fractions extracted from the same brew type.

References

[1] Jesch, E.D.; Carr, T.P. (2017). *Prev. Nutr. Food Sci.* 22, 67–80.
 [2] Nunes FM, Coimbra MA, Duarte AC, Delgadillo I (1997). *J Agric Food Chem* 45:3238–3243.
 [3] Coreta-Gomes FM, Lopes GR, Passos CP, et al (2020). *Nutrients* 12:1–15.

Coffee + AG fraction (Et75) was the most effective sample to decrease cholesterol solubility

