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## Processing of spent coffee grounds into Prebiotic Functional Oligosaccharides

Kumar Pankaj (Master Degree Student), ITMO University

[373304@niuitmo.ru](mailto:373304@niuitmo.ru)

### Introduction

This study aims at exploring the concept of transforming Spent coffee grounds into valuable prebiotics, contributing to both waste reduction and gut health improvement. An estimated 6-8 million tonnes of SCG are discarded globally every year, representing 30-40% of the total coffee bean weight (International Coffee Organization, 2023). This waste primarily ends up in landfills, contributing to methane emissions and environmental pollution. Diverting this waste stream is crucial for environmental sustainability. Coffee contains manno-oligosaccharides, galacto-oligosaccharides, arabinoxylan-oligosaccharides, and cello-oligosaccharides. Because of their crucial physicochemical and physiological characteristics, these oligosaccharides serve as prebiotics, antioxidants, dietary fiber, adjuvants, pharmaceuticals, nutraceutical foods, gut health, immune system boosters, cancer therapy, and many more applications. (Tripathi *et al.*,2023).

### Main Part

- 1) To extract the prebiotic oligosaccharides different methods in a schematic way are used starting from defatting of SCG to remove lipids (Caetano *et al.*,2012).
- 2) The extraction using green methods like Ultrasonic method (Miladi *et al.*,2021) and Microwave method (Passos *et al.*,2019).
- 3) The purification is carried out using filtration, centrifugation, and chromatographic techniques, followed by the characterization of the oligosaccharides including composition, degree of polymerization, and prebiotic activity using techniques like HPLC chromatography, mass spectrometry (Kailemia *et al.*,2013).
- 4) The extraction process of prebiotic oligosaccharides from coffee spent ground and the results of this study are still pending. However, I am eagerly preparing to present the findings of this ongoing research during my presentation at the conference.

### Conclusion

This study explores the transforming waste into value by converting spent coffee grounds (SCG) into gut healthy prebiotics. Millions of tons of SCG contribute to landfill pollution, but this study demonstrates its potential for upcycling. The proposed methods effectively extract prebiotics oligosaccharides from SCG, offering a sustainable solution for waste management and potentially improving gut health. Further research is needed for optimization and vivo studies.

### References

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