



PHENOLIC COMPOSITION, ANTIOXIDANT AND ANTIMICROBIAL PROPERTIES OF APPLE AND PEAR PRUNING WOOD RESIDUES



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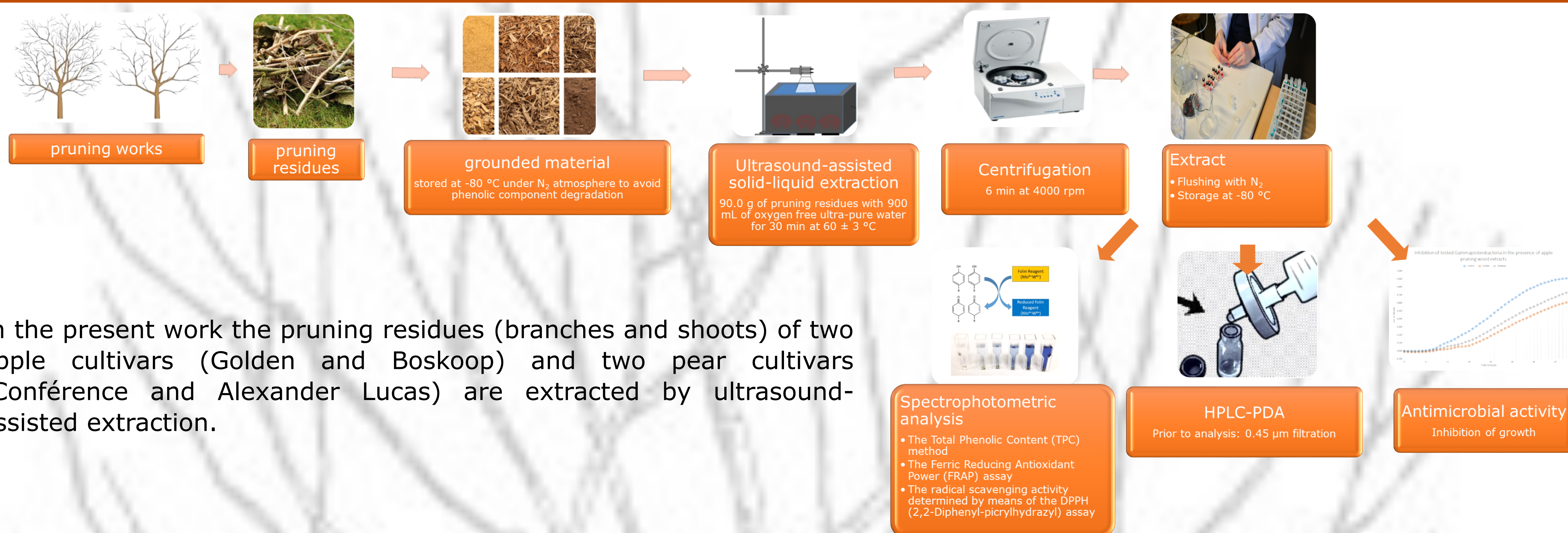
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Introduction

Fruit growers annually have hundreds of tons of wood waste. In 2016 the 16000 hectares of apple and pear orchards in Belgium produced 128000 ton of pruning waste. The pruning waste is now often burned near the orchard, which has an impact on the carbon footprint of these fruit productions, or chopped and left near the orchard. Growers want to manage the pruning waste residues by generating high-added-value molecules from it. The objective of this preliminary study is to evaluate the extractable phenolic components from one-year-old apple and pear pruning residues.

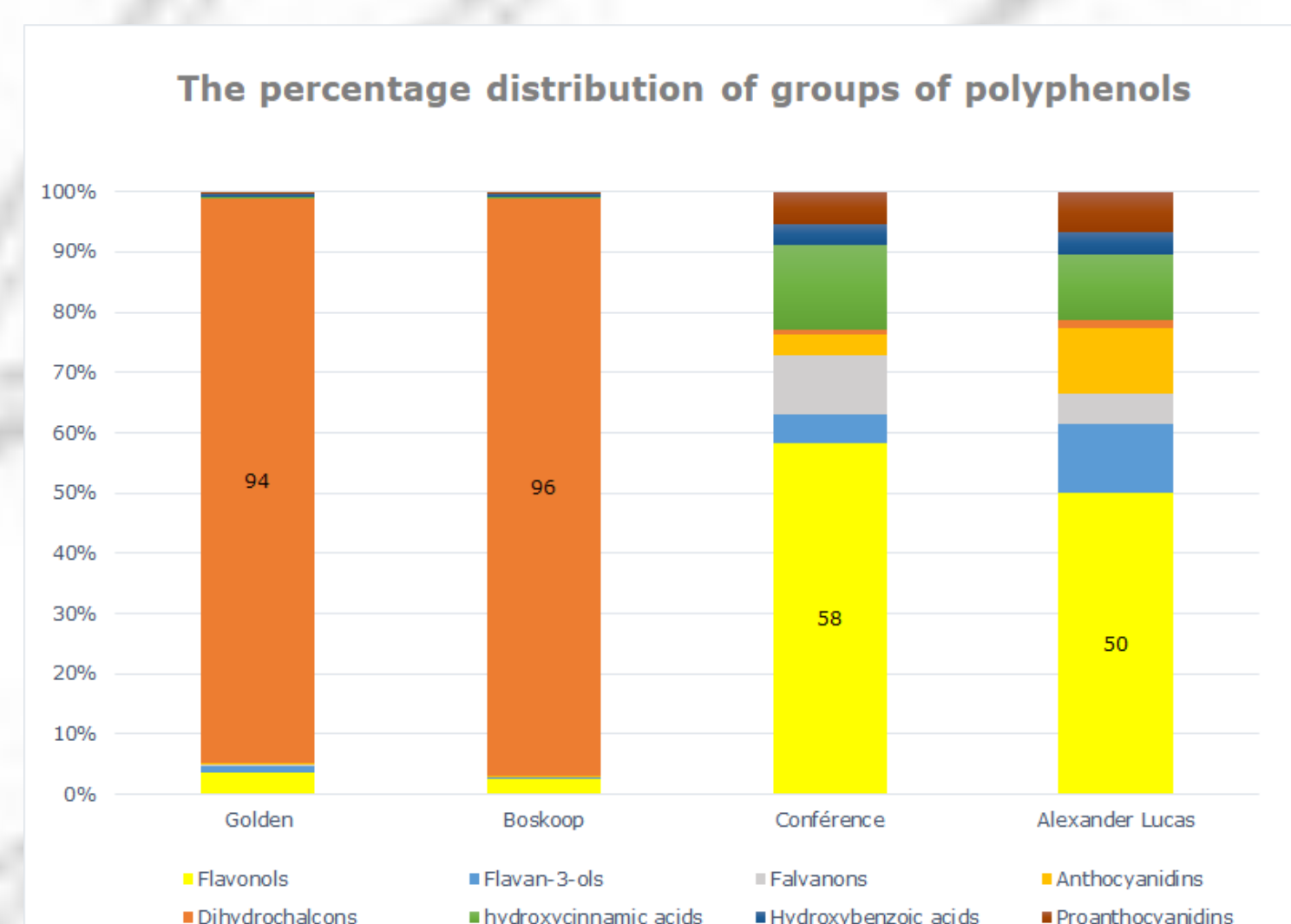
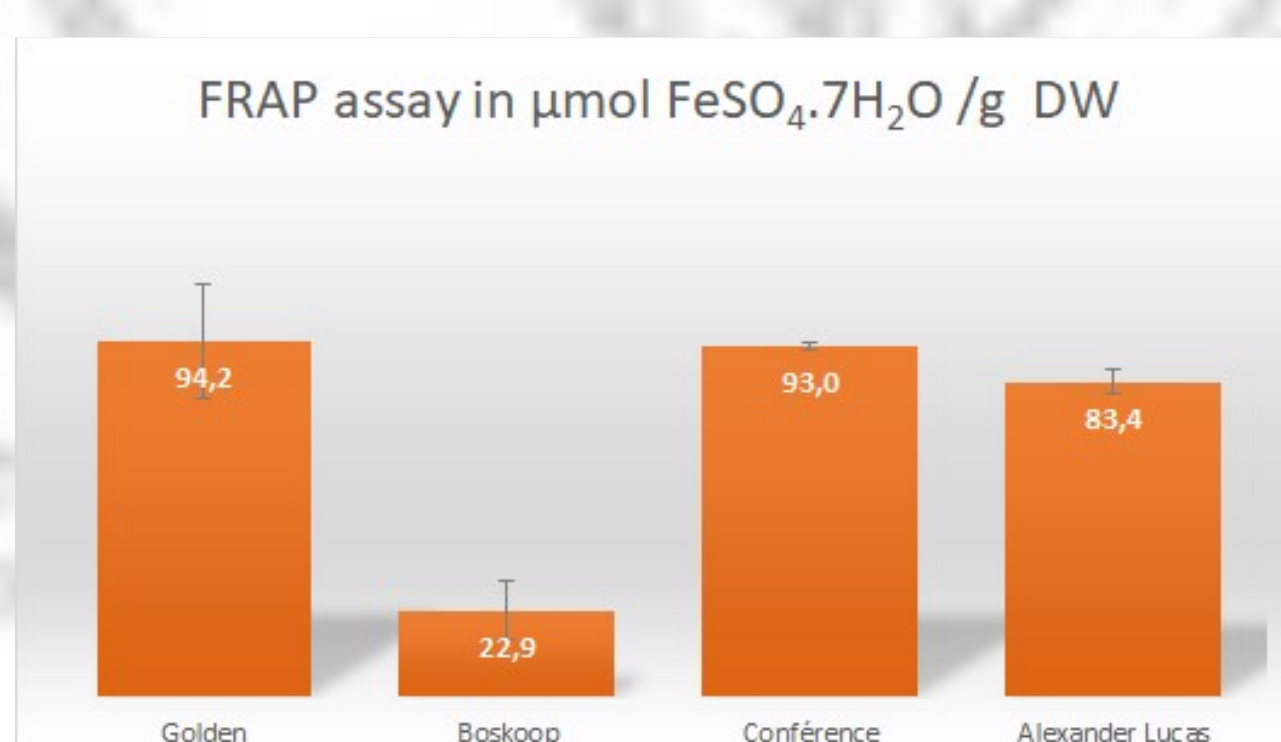
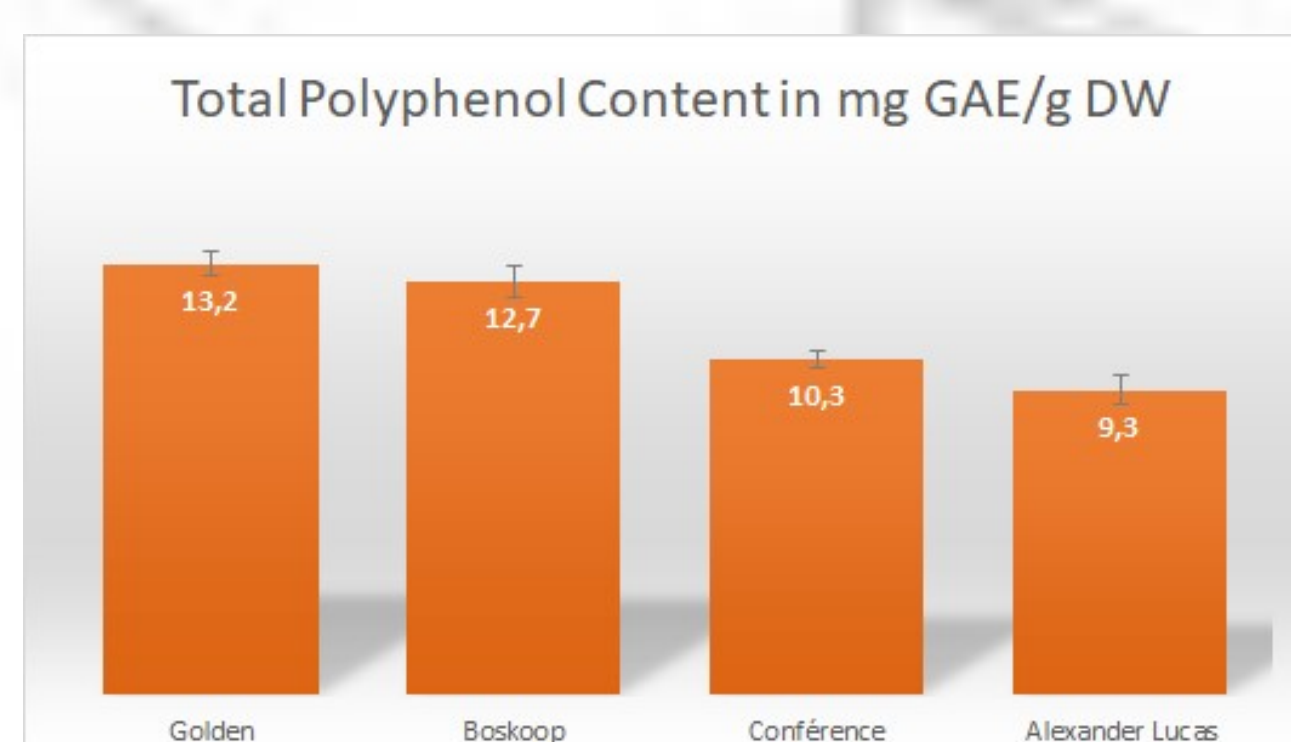
Materials and methods



Results and discussion

The total polyphenol content was higher for apple pruning residues extracts than for pear pruning residues extracts. The pruning residues extract from Golden has the highest antioxidant activity. HPLC-PDA analysis revealed that phloredzin was the main contributor to the phenolic composition of apple pruning residues extracts, representing 92% of the total amount of phenolic components quantified. In pear pruning residues extracts the most considerable component is quercetin 3-D-galactoside (only flavonol indicated). In the preliminary study of the antimicrobial capacity against the tested Gammaproteobacteria, only the apple pruning residues extracts inhibited growth.

Groups of polyphenols	
Proanthocyanidins	Procyanidin B1 Procyanidin B2
Hydroxybenzoic acids	Gallic acid Vanillic acid
Hydroxycinnamic acids	Cinnamic acid P-coumaric acid Caffeic acid Ferrulic acid Chlorogenic acid
Dihydrochalcones	Phloretin Phloredzin
Anthocyanidins	Idaein
Kuromanin chloride	
Falvanons	Naringin Naringenin
Flavan-3-ols	(+)-Catechin (-)-Epicatechin
Flavonols	Kaempferol 3 glucoside Quercetin 3-D-galactoside Avicularin



Conclusion

The spectrophotometric analysis of TPC does not disclose the differences between the investigated cultivars. These contrasts are clearly indicated by the analysis of phenolic profile content. The antimicrobial capacity could only be demonstrated for apple pruning residues extracts. This preliminary study indicates that the pruning residues, resulting from the pruning practices to maintain the apple and pear yields, will lead to different applications. Further research needs to explore the potential of pruning residues as a valuable waste stream for bioactive components or polyphenols.

Acknowledgement