

Enzymatic Synthesis of Phenylethyl Fatty Esters from Fixed Oil Extracted from *Syagrus coronata* (Mart.) Becc.

Diego Flosi Silva¹

¹Department of Fundamental Chemistry – Federal University of Pernambuco (UFPE)

INTRODUCTION & AIM

Fatty esters constitute a relevant class of organic compounds widely used in industry due to their unique properties and characteristic aromas. These compounds can be synthesized through esterification between carboxylic acids and alcohols, a process that, when conducted via biotechnological routes, offers advantages such as high selectivity, mild operating conditions, and products considered natural [1,2].

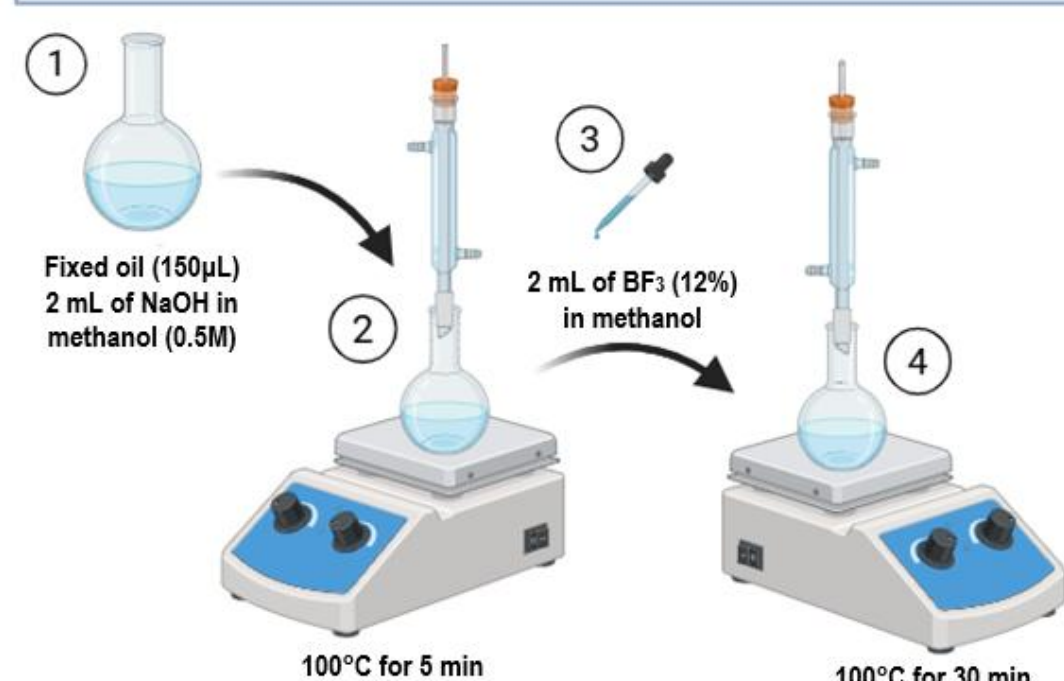
In this context, lipases stand out as efficient biocatalysts, capable of promoting reactions in solvent-free systems, with the added benefits of catalyst reuse and a low environmental impact. Choosing renewable sources of fatty acids, such as vegetable oils, represents a sustainable strategy. Among these, licuri oil (*Syagrus coronata*), rich in fatty acids and of socioeconomic importance, emerges as a promising raw material. On the alcoholic side, 2-phenylethanol deserves attention for its biotechnological value, due to its antimicrobial properties and floral rose aroma, which expands its use in perfumery, cosmetics, and food [3-5].

Therefore, the objective of this work is to perform the enzymatic synthesis of phenylethyl esters through the reaction between licuri oil and 2-phenylethanol, catalyzed by *Pseudomonas* lipase in a solvent-free system.

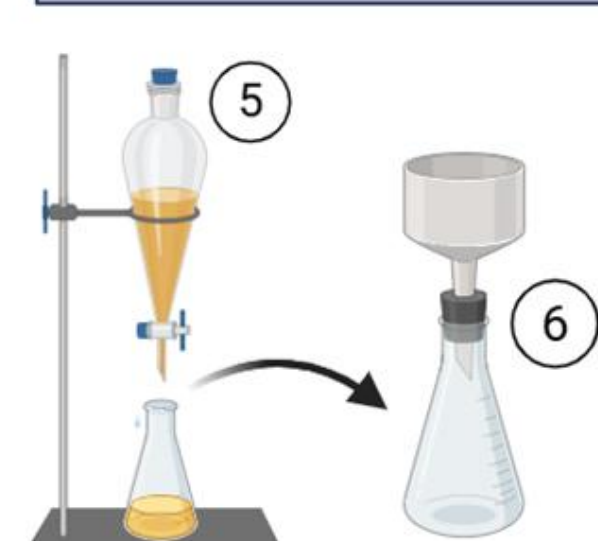
METHOD

Chemical characterization of *Syagrus coronata* oil

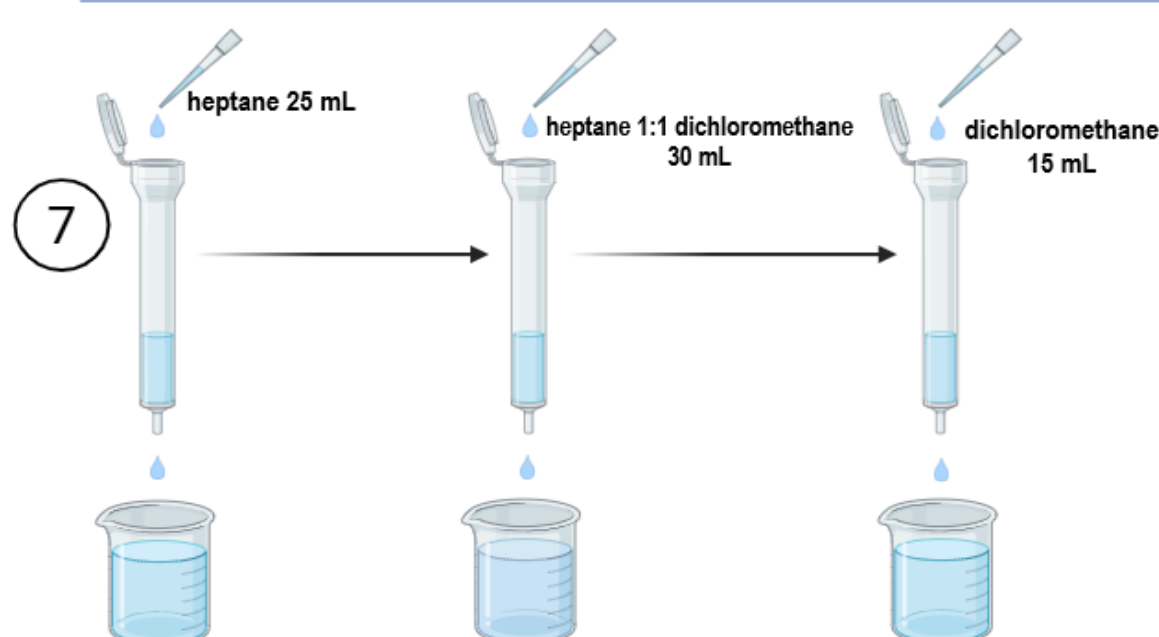
Transesterification



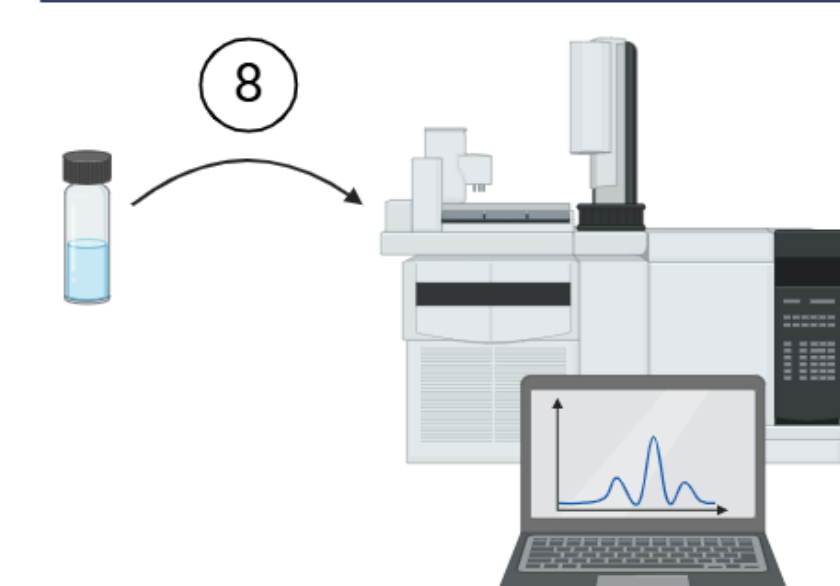
Filtration and drying



Separation and purification

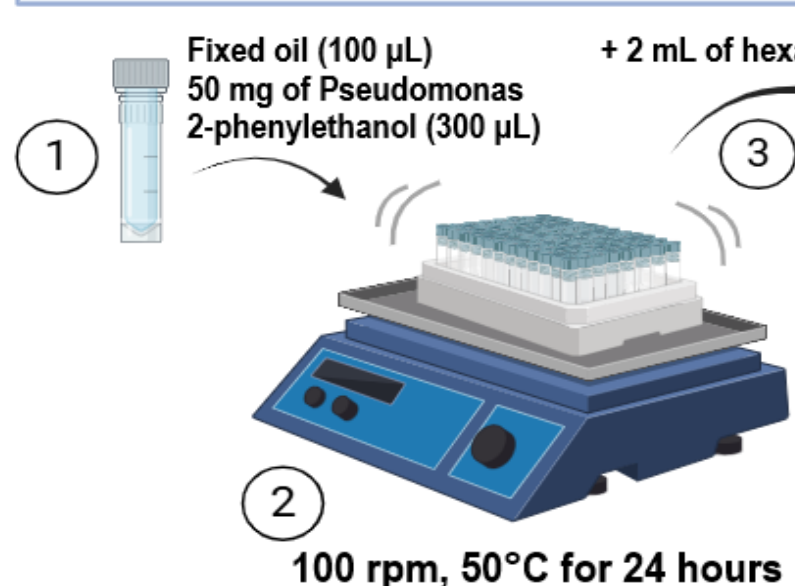


Chromatographic analysis

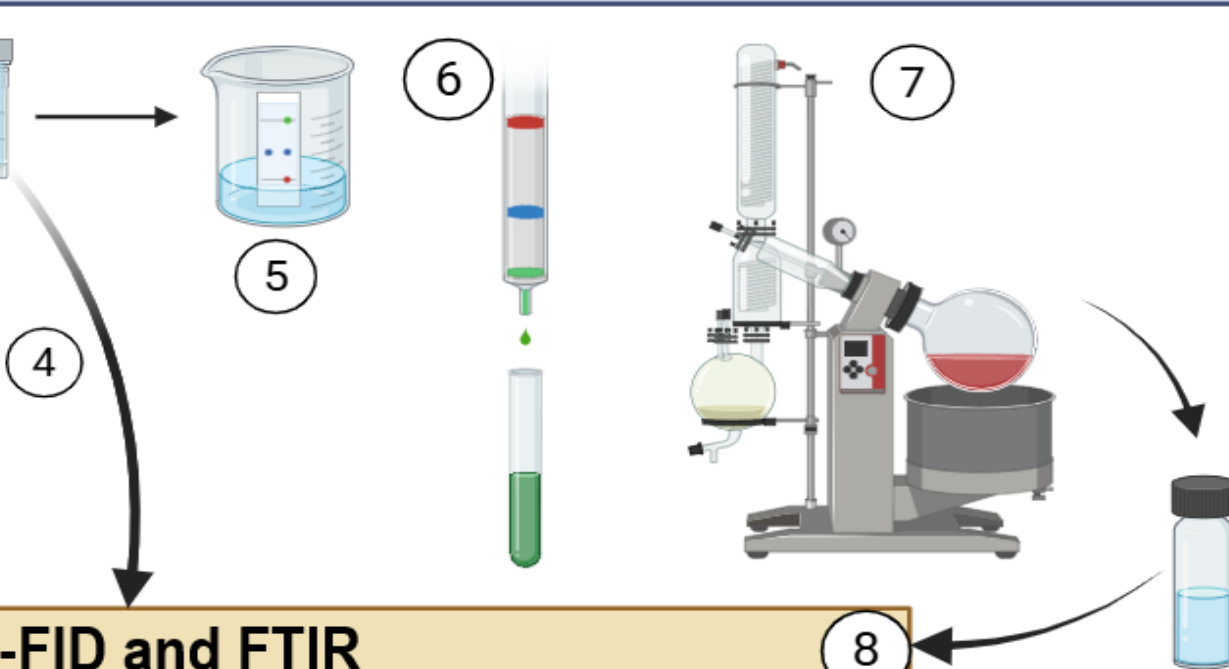


Synthesis and characterization of phenylethyl esters

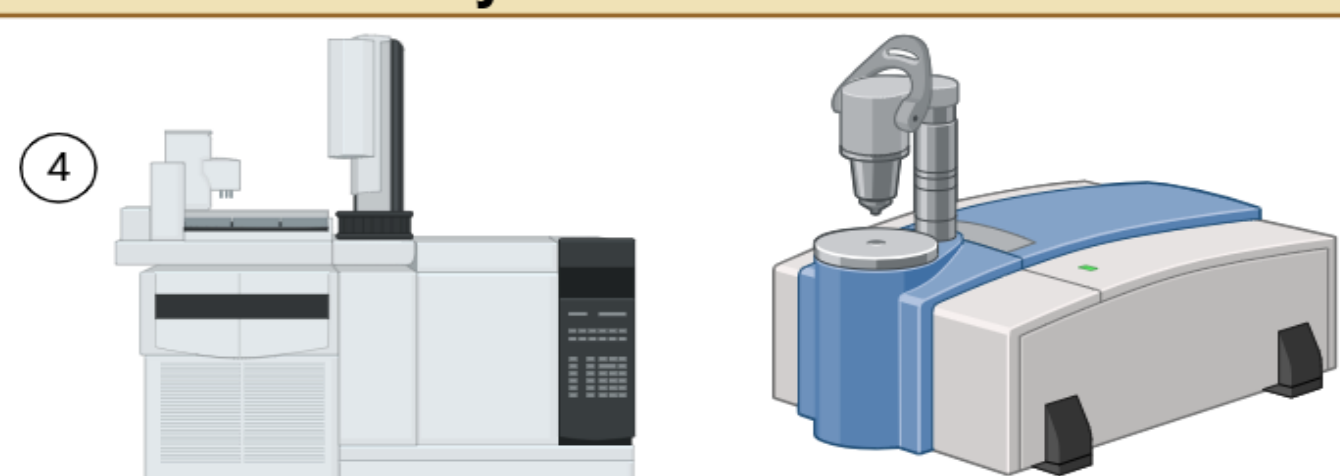
Esterification reaction



Separation and purification

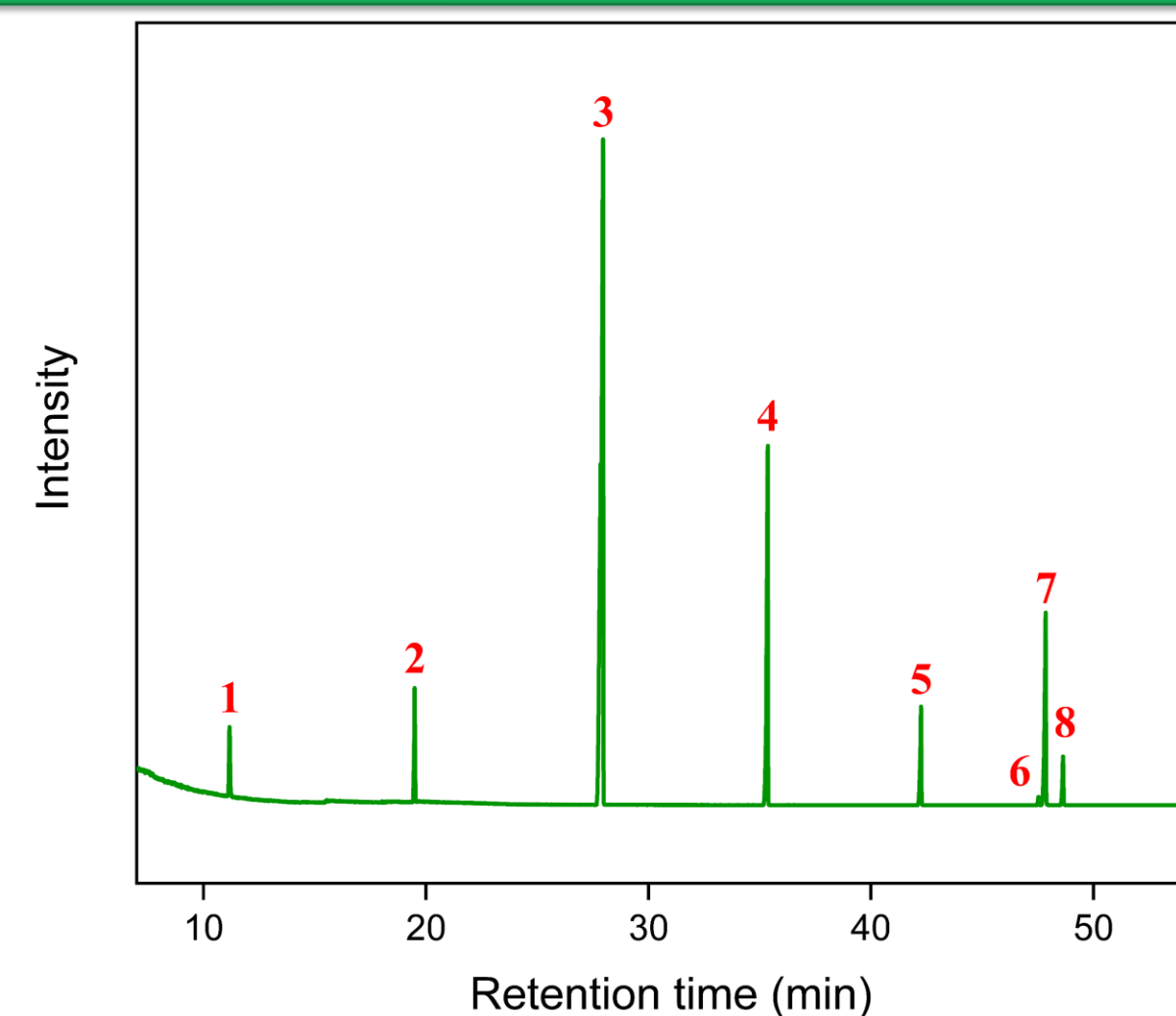


Analysis in GC-FID and FTIR



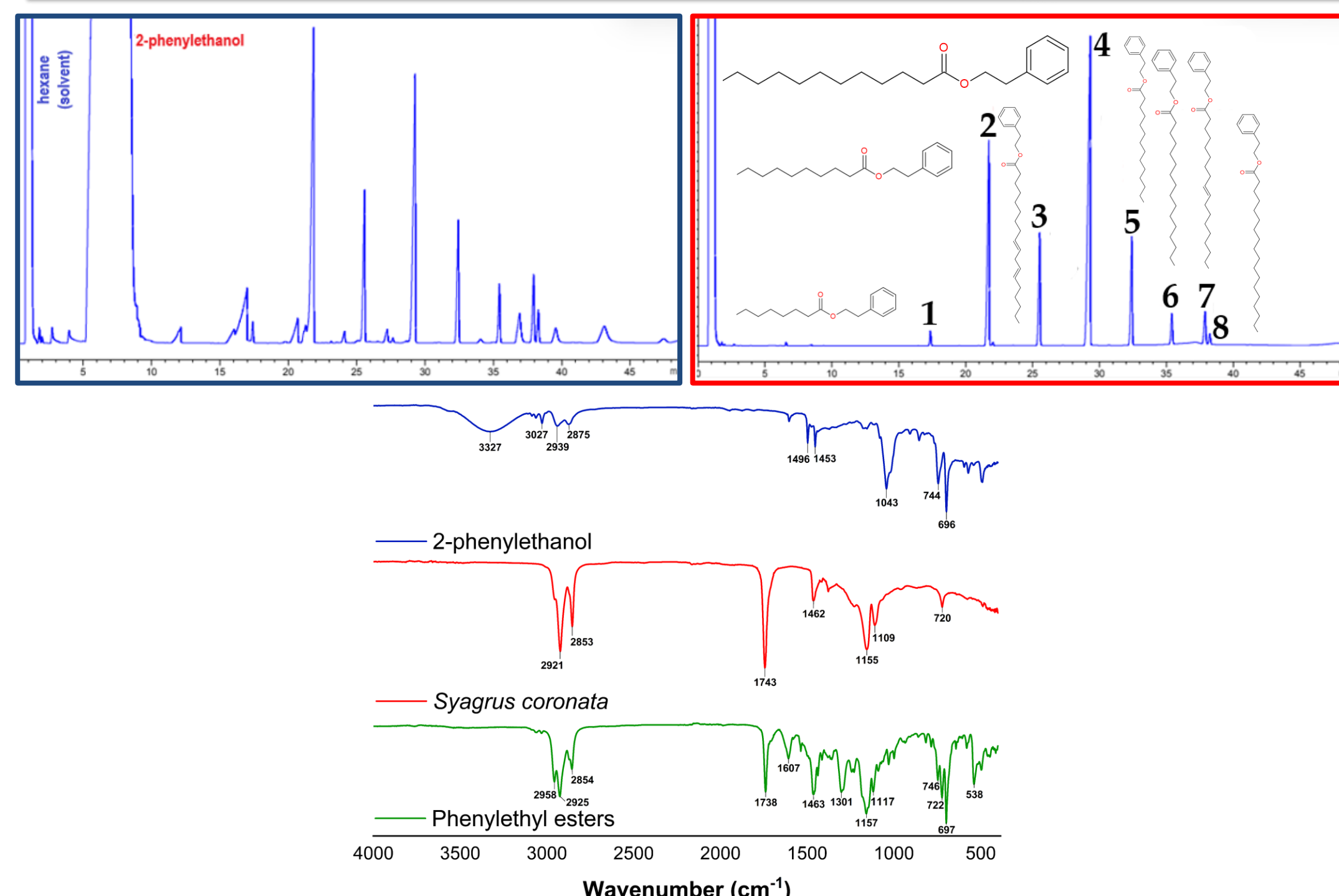
RESULTS & DISCUSSION

Chemical characterization of *Syagrus coronata* oil



Fatty acids	Peak number	Retention time (min)
Caprylic acid	1	11,317
Capric acid	2	19,739
Lauric acid	3	28,155
Myristic acid	4	35,569
Palmitic acid	5	42,476
Linoleic acid	6	47,792
Oleic Acid	7	48,059
Stearic Acid	8	48,679

Synthesis and characterization of phenylethyl esters



CONCLUSION

The methodology employed proved to be efficient for the enzymatic synthesis of phenylethyl esters from fixed licuri oil and 2-phenylethanol, resulting in the successful production of compounds with a characteristic floral aroma. Furthermore, it is noteworthy that this study represents the first report on the enzymatic synthesis of phenylethyl esters from licuri oil.

FUTURE WORK / REFERENCES

Further studies are recommended to optimize the reaction parameters and to investigate the biological activities of these esters, aiming to expand their industrial and pharmacological potential.

- Ortega-Requena et al., 2024. *Mater.*
- Aragão et al., 2009. *Quim. Nova.*
- Guimarães et al., 2021. *Desenv. Meio Amb.*
- Sun & Liu, 2015. *Food Biochem.*
- Moreira et al., 2024. *J. Biotechnol.*